



BIM based fast toolkit for  
Efficient rEnovation in Buildings

# D10.10 Guidelines for BIM implementation for private stakeholders



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### **D10.10 Guidelines for BIM implementation for private stakeholders**

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## EXECUTIVE SUMMARY

The outputs here described are the results of Task 10.3 “Development of guidelines for innovative BIM-based efficient renovation uptake” for the case of the private sector.

The document contains the guidelines for BIM implementation for private stakeholders in the case of renovation of residential buildings.

The guidelines define the procedures for producing, storing, managing, and transmitting organization's information digitally.

The guidelines were validated by a case study developed in the private company Risanamento Spa. The case study is presented in the appendix to this document.

The guidelines are made of a principal document that is the Organization Information Guidelines (OIL) and of other documents that are annexes to the OIL. All the documents are templates to be used from private stakeholders of the construction sectors.

Namely, the documents are

A. Organization Information Guidelines (OIL)

A1. Organization Information Requirements (OIR)

A2. Organization Information Maps (OIM)

B. Asset Information Guidelines (AIL)

B1. Asset Information Requirements (AIR)

B2. Asset Information Models (AIM)

C. Project Information Guidelines (PIL)

C1. Project Information Requirements (PIR)

C2. Project Information Model (PIM)

D. Exchange Information Requirement (EIR)

E. Platform Data Management (PDM)

E1. Common Data Environment (CDE)

E2. Data Room (DR)

## **PUBLISHING SUMMARY**

The document contains the guidelines for BIM implementation for private stakeholders in the case of renovation of residential buildings.

The guidelines allow to facilitate the private stakeholders in the application of BIM methodology inside their organization and in the awarding of works and services from appointing parties.

The outputs here described are the results of Task 10.3 “Development of guidelines for innovative BIM-based efficient renovation uptake” for the case of the private sector.

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## 1 Introduction

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The European Directive 2014/24/EU states that EU Member States may require in the coming years the use of specific electronic tools for public tenders. Then, the expected large-scale application of BIM due to the EU Directive recommendations will cause a rapid evolution of the market and will imply a strong change within the construction companies if they want to maintain competitiveness in the new BIM based digital era. Indeed, the (private) companies to be competitive will need to evolve: the requirement of electronic tools includes a series of obligations that impact on the private organizations, relating, for example, staff training, necessary hardware and software equipment and offices reorganization, in the name of more efficient control and management of the information exchange processes based on digitalization and collaboration.

Moreover, beyond the legal requirements, the BIM methodology will enable the in-depth knowledge of the heritage and its maintenance status and the correct management of information, that are central elements to ensure careful planning of ordinary and extraordinary maintenance interventions; all this to ensure the performance of buildings over the years, maintaining and improving their performance in terms of energy efficiency and environmental sustainability, while preserving their economic value.

In this context, therefore, this document constitutes a support for private organizations in the process of approaching the use of BIM, with the aim of:

- Be more competitive in the new BIM-based growing market, by offering them indications to participate to public tenders where BIM is required.
- Encouraging the digital transformation by promoting working collaboration based on BIM between private and public stakeholders.
- Provide a clear and common vision of the BIM application process within the organization
- Ensure the interoperability of the BIM model with the different software platforms used
- Define BIM information roles considering their support to traditional roles

The document presents the guidelines (OIL as main document) and its attachments in the body text and the case study of Risanamento Spa in the appendix.

Namely, the structure of the guidelines is

### A. Organization Information Guidelines (OIL)

#### A1. Organization Information Requirements (OIR)

#### A2. Organization Information Maps (OIM)

### B. Asset Information Guidelines (AIL)

#### B1. Asset Information Requirements (AIR)

#### B2. Asset Information Models (AIM)

### C. Project Information Guidelines (PIL)

#### C1. Project Information Requirements (PIR)

#### C2. Project Information Model (PIM)

### D. Exchange Information Requirements (EIR)

### E. Platform Data Management (PDM)

#### E1. Common Data Environment (CDE)

#### E2. Data Room (DR)

## 2 Organization Information Guidelines

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### 2.1 Introduction

This Organization Information Guidelines (OIL) defines the procedures for producing, storing, managing, and transmitting your organization's information digitally.

The OIL joins the Quality Manual (ISO 9000), where present, and draws from its indications and references. The OIL integrates the Quality Manual for information aspects in a digital sense.

The following mentioned documents shall form an integral part of the OIL and shall form an annex thereto:

A. Organization Information Guidelines (OIL)

A1. Organization Information Requirements (OIR)

A2. Organization Information Maps (OIM)

B. Asset Information Guidelines (AIL)

B1. Asset Information Requirements (AIR)

B2. Asset Information Models (AIM)

C. Project Information Guidelines (PIL)

C1. Project Information Requirements (PIR)

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E1. Common Data Environment (CDE)

E2. Data Room (DR)

The information flows are defined as follows Figure 1:

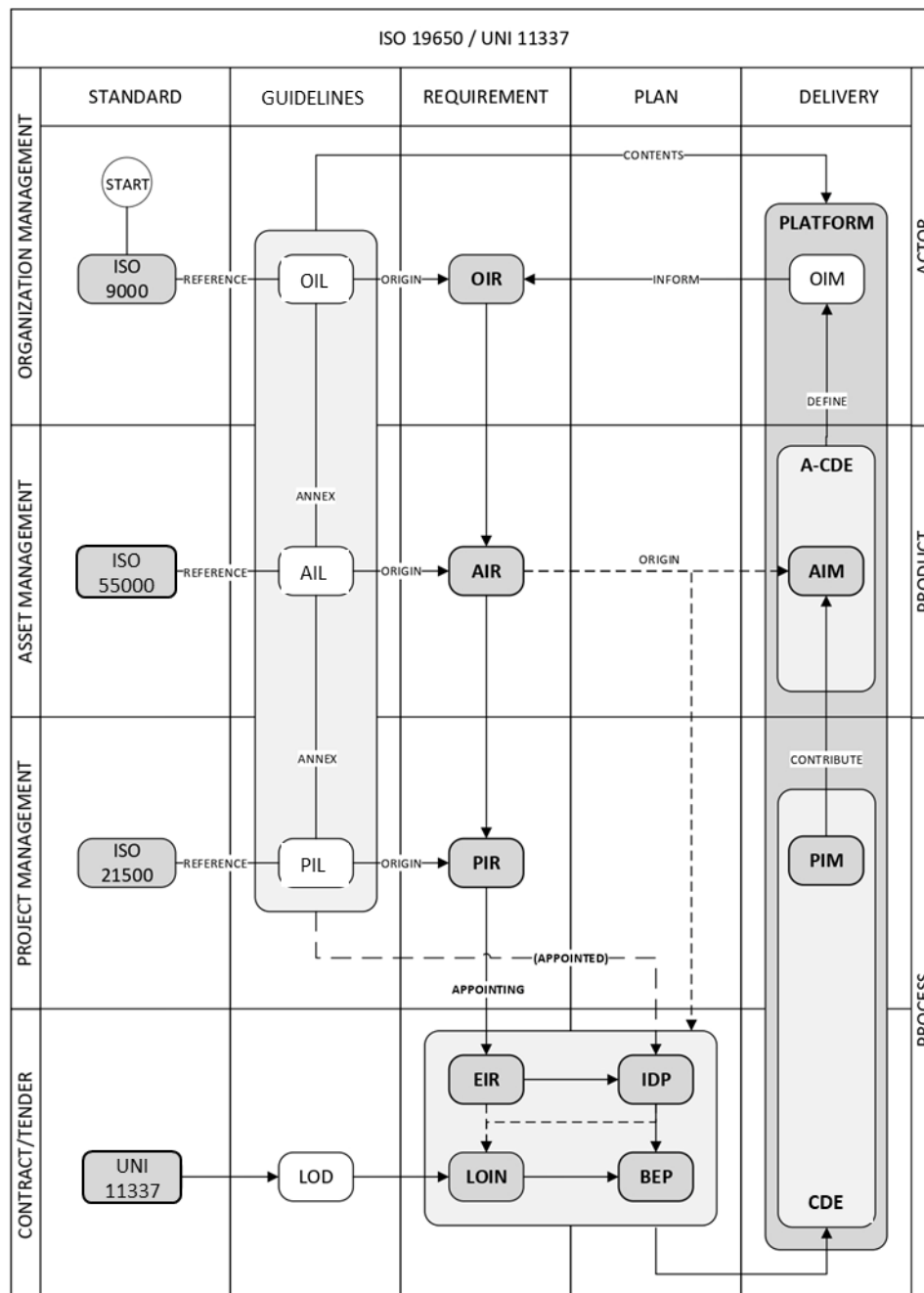


Figure 1 - Connection diagram of the manuals from EN ISO 19650/UNI 11337

## 2.1.1 Regulatory references

### 2.1.1.1 Standards

Reference is made to the following Standards:

- EN ISO 19650-1:2018 - *Organization and digitization of information about buildings and civil engineering works, including Building Information Modelling (BIM) - Information management using Building Information Modelling - Part 1: Concepts and principles*

- EN ISO 19650-2:2018 - *Organization and digitization of information about buildings and civil engineering works, including Building Information Modelling (BIM) - Information management using Building Information Modelling - Part 2: Delivery phase of assets*
- EN ISO 9000:2015 - *Quality management systems - Fundamentals and vocabulary*
- EN ISO 9001:2015 - *Quality management systems – Requirements*
- EN ISO 9004:2018 - *Quality management - Quality of an organization – Guidelines to achieve sustained success*

## 2.1.2 Acronyms and glossary

ACRONYMS	DEFINITION TERMS	
BIM	Building Information Modelling	Use of a shared digital representation of a built asset to facilitate design, construction and operation processes to form a reliable basis for decisions (EN ISO 19650-1:2018)
	Datum	Intangible, elementary cognitive element, interpretable within a communication process through previously shared rules and syntax.
	Information model (Model)	Set of structured and unstructured information containers (EN ISO 19650-1:2018)
	Integrated Design	Multidisciplinary building process aimed at optimizing the building process.
	Client: general definition	Any physical or legal entity that commissions, in any form of contract, a job, a service or a supply.
	Appointing party	Receiver of information concerning works, goods or services from a lead appointed party (EN ISO 19650-1:2018)
	Appointed party	Provider of information concerning works, goods or services (EN ISO 19650-1:2018)
	Collaborators	Executor with a non-continuous collaboration with the organization for certain interventions (engineering and / or architecture firms, professionals in specific field, installers, specialized companies etc.)
	Supply	Subject "supplier" of the organization of products for the performance of its activities (manufacturers of components such as systems, finishes, etc.)
	Customer	Private non-market operator requesting work activities or service to the organization; general consumer.

For any other term of an informative nature, reference is made to the binding legislation and to the voluntary standards (CEN standards, ISO standards, if not in contrast).

## 2.2 Purpose

The Organization Information Guidelines OIL aims to define the general information rules of the organization, to promote communication, transparency, use and storage over time of the data generated by it or towards it.

## 2.3 Activities

### 2.3.1 Information benchmark

*Benchmark here your organization (Describe the core activities of the organization and how it is collocated in the market)*

The following table shows any barriers and opportunities deriving from the digitization of the Organization

**Table 1: Information barriers and opportunities**

EXISTING INFORMATION BARRIERS	EXPECTED INFORMATION OPPORTUNITIES

Using reference models of this type certainly brings benefits to the entire organization that can be summarized through the SWOT analysis shown in the following table:

**Table 2: Swot analysis**

INTERNAL FACTORS	STRENGTHS (S)	WEAKNESSES (W)
EXTERNAL FACTORS	OPPORTUNITY (O)	THREATS (T)

### 2.3.2 Products and services

*Describe the products and services offered by the Organization:*

- For example: construction, maintenance and administration of land and buildings, other....

To do this the organization produces:

- For example: data collection; design; design patterns; coordination and verification models; As-built models; Asset models; Management and maintenance models; Other...

The following table shows the distribution of information services managed by the Organization:

**Table 3: Information services**

<b>PHASE</b>	<b>INTERNAL INFORMATION SERVICES</b>	<b>CONSULTING</b>	<b>EXTERNAL INFORMATION SERVICES</b>
<i>INITIATIVE</i>			
<i>INITIATION</i>			
<i>DESIGN: CONCEPT</i>			
<i>DESIGN: PRELIMINARY</i>			
<i>DESIGN: DEVELOPED</i>			
<i>DESIGN: DETAILED</i>			
<i>CONSTRUCTION</i>			
<i>BUILDING USE</i>			
<i>END OF LIFE</i>			

## 2.4 Relational organization charts

### 2.4.1 Relational organization chart outside the organization

The following paragraphs contain indications in reference to the relationships that the Organization develops with external parties to carry out the activities that characterize it.

#### 2.4.1.1 *Parties involved*

The following table shows the external parties involved in the information processes of the Organization:

<b>TPOLOGY</b>	<b>SUBJECT</b>	<b>NOTES</b>
Commissioning		
Collaborations		
Supply		

#### 2.4.1.2 *External relations organisation chart*

*Put here the diagram/chart describing the organization chart of external relations to the Organization with reference to what is reported in the table in the previous paragraph:*

## 2.4.2 Relational organization chart within the organization

The following paragraphs contain information on the relationships that Organization develops internally within its organization to carry out the activities that characterize it.

### 2.4.2.1 Organization units

Put here the table describing the internal units involved in the processes involved in the Organization:

TPOLOGY	UNIT	RELATION	NOTES

Put here a graphical an example (image) of what is defined in the table above:

### 2.4.2.2 Units/departments of the organization

The following table shows the functions and activities carried out by each unit/ department that makes up the Organization:

**Table 4: Functions and activities related to the units**

UNIT/DEPAR TMENT	FUNCTION	ACTIVITIES	RESPONSIBLE	EMAIL	TELEPHONE

### 2.4.2.3 Organization chart of internal relations

Put here the organizational chart that shows the internal of the Organization according to the units and functions identified in the previous point.

## 2.5 Information flows

### 2.5.1 External information flows of the organization

Put here the organization chart that represents the relationship between the Organization and the companies involved externally.

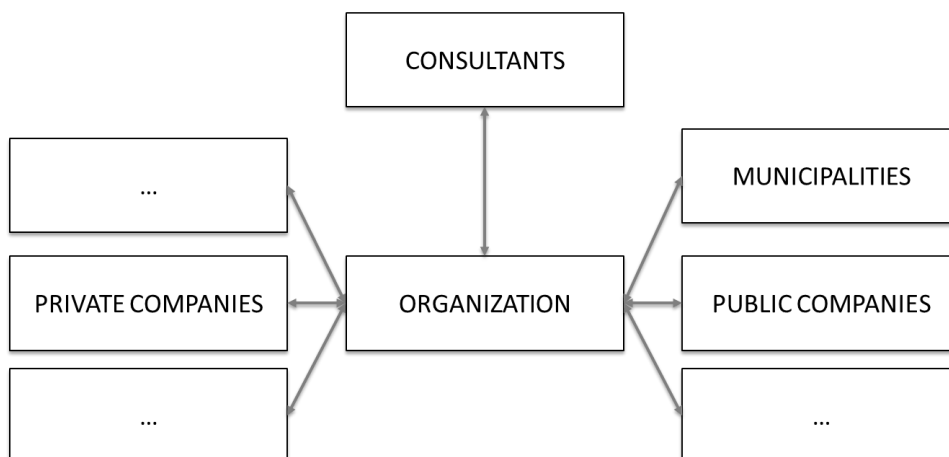


Figure 2 - Example of information flow of the organization

### 2.5.2 Internal information flows of the organization

#### 2.5.2.1 Information flows between Group Units

Put here the graph (and explain it) that shows the flow between the Units of the group defined in the previous paragraphs of this document, with reference to the Organization.

#### 2.5.2.2 Information flows between functions/areas of the organization

Put here the graph (and explain it) that shows the flow between the units of the Organization.

## 2.6 Dedicated tools

### 2.6.1 Organization Hardware Tools

Describe here the hardware instrumentation philosophy used by the Organization in response to the information flows (internal and external) presented in the previous chapter.

Describe the technical and performance characteristics essential for the purposes to which the hardware systems are dedicated.

Table 5: Hardware

HARDWARE		
Nr. (number of HW available)	Typology (e.g. notebook, desktop etc.)	Prevailing features




## 2.6.2 Software Tools of the organization

*Describe here the software used within the Organization.*

**Table 6: Software**

SOFTWARE				
Utilization	Model	Brand	Version	N° of workstation

## 2.7 Information security policies

### 2.7.1 Data secrecy

Insert the Regulation adopted by the Organization (could be the General Data Protection Regulation (GDPR))

### 2.7.2 Data security

Insert the Regulation adopted by the Organization (could be the General Data Protection Regulation (GDPR))

### 2.7.3 Guarantee of access over time

Insert the Regulation adopted by the Organization (could be the General Data Protection Regulation (GDPR))

## 2.8 Resource Management

### 2.8.1 Leadership and commitment

*Describe here the leadership and commitment to the BIM management system*

for example: ensuring that the objectives related to the BIM management system are consistent with the organization environment and with the strategic management of the organization.

### 2.8.2 Competence and training

*Describe here the organization's commitment toward its staff:*

- For example: determine the skills necessary for people who do work activities and that affect the performance and efficacy of the BIM management system; ensure that people are able according to appropriate education, training, or experience.

Applicable actions may include, for example: providing training; mentoring or reallocation of people currently employed; or the recruitment of skilled persons.

*Describe here the Organization undertakes to define and ensure an adequate level of competence for the persons who hold the function of:*

- BIM Manager;
- BIM Coordinator;
- BIM Specialist;
- CDE Manager.

Put here also if the Organization has the presence of professional certification for the functions listed above of BIM Manager, BIM Coordinator, BIM Specialist and CDE Manager. In the absence of the professional certification referred to above, the level of competence must be demonstrated by means of detailed documentation on the previous experiences of the individuals involved and matured in appropriate time frames.

If the function is held by several people working in a group, the competence requirements defined by the EN ISO 19650-1: 2018 can be met by all the knowledge, skills and competences of all group members.

### **2.8.3 Risks and opportunities: actions to address**

When planning the BIM management system, the Organization must consider external and internal factors relevant to its purposes and influencing its ability to achieve expected results for its BIM management system to determine the risks and opportunities to be addressed in order to:

- ensure that the BIM management system can accomplish the expected results;
- prevent or reduce side effects;
- achieve improvement.

For this reason, the Organization must plan:

- actions to address risks and opportunities;
- how to integrate and fulfill the actions in the BIM management system processes;
- evaluate the efficacy of the actions undertaken

### 3 Organization Information Requirements (OIR)

#### 3.1 Introduction

This document is Annex A to the OIL Organization Information Guidelines.  
For a better understanding of the Organization Information Requirements (OIR), you should also refer to the Organization Information Guidelines (OIL) and the Organization Information Maps (OIM).

##### 3.1.1 Regulatory references

###### 3.1.1.1 Standards

Reference is made to the following Standards:

- EN ISO 19650-1:2018 - *Organization and digitization of information about buildings and civil engineering works, including Building Information Modelling (BIM) - Information management using Building Information Modelling - Part 1: Concepts and principles*
- EN ISO 19650-2:2018 - *Organization and digitization of information about buildings and civil engineering works, including Building Information Modelling (BIM) - Information management using Building Information Modelling - Part 2: Delivery phase of assets*
- EN ISO 9000:2015 - *Quality management systems - Fundamentals and vocabulary*
- EN ISO 9001:2015 - *Quality management systems – Requirements*
- EN ISO 9004:2018 - *Quality management - Quality of an organization – Guidelines to achieve sustained success*

##### 1.1.1 Acronyms and glossary

ACRONYMS	DEFINITION TERMS	
	Requirements	Required qualities and conditions necessary to achieve a goal.

For any other term of an informative nature, reference is made to the mandatory legislation in question and, below, to the voluntary standards (CEN standards, ISO standards, if not in contrast).

#### 3.2 Purpose

The purpose of this document is to identify the information requirements of the Organization by providing useful information to the subsequent manuals on Asset and Project requirements (AIR – PIR) and for the drafting of Asset and Project models (AIM – PIM).

#### 3.3 Information Requirements of the organization

##### 3.3.1 External requirements

*Insert in the following table the subjects involved in relations outside the organization (refer to section 4.1.1 Subjects involved in the Organization Information Guidelines – OIL) and the information requirements necessary for each of them:*

**Table 7: External Requirements**

SUBJECT	INFORMATION REQUIREMENTS	
	INPUT	OUTPUT
Insert subject (e.g. design studios, professionals, hardware and software resellers etc.)	Needs description	Needs description
	Needs description	Needs description
	Needs description	Needs description
	Needs description	Needs description
	Needs description	Needs description

### 3.3.2 Internal requirements

#### 3.3.2.1 Group Entities

Insert in the following table the subjects involved in the internal relations of the organization (refer to paragraph Entity of the group the Organization Information Guidelines - OIL) and the necessary information requirements for each of them:

**Table 8: Entities of the group**

ENTITY	INFORMATION REQUIREMENTS	
	INPUT	OUTPUT
	e.g., economic resources	e.g., obligations towards the public administration, time and costs of the intervention, etc.

#### 3.3.2.2 Functions/areas of the organization

Insert in the following table the units/departments of which the organization is composed (refer to paragraph Units/Departments of the organization of the Organization Information Guidelines (OIL) and the information requirements necessary for each of them:

**Table 9: Units of the organization**

UNIT/DEPARTMENT	INFORMATION REQUIREMENTS	
	INPUT	OUTPUT

## 4 Organization Information Maps (OIM)

### 4.1 Introduction

This document is Annex A1 to the OIL - Organization Information Guidelines. For a better understanding of the Organization Information Maps (OIM), you should also refer to the Organization Information Guidelines (OIL) and the Organization Information Requirements (OIR).

### 4.2 Regulatory references

#### 4.2.1 Standard

Reference is made to the following Standards:

- EN ISO 19650-1:2018 - *Organization and digitization of information about buildings and civil engineering works, including Building Information Modelling (BIM) - Information management using Building Information Modelling - Part 1: Concepts and principles*
- EN ISO 19650-2:2018 - *Organization and digitization of information about buildings and civil engineering works, including Building Information Modelling (BIM) - Information management using Building Information Modelling - Part 2: Delivery phase of assets*
- EN ISO 9000:2015 - *Quality management systems - Fundamentals and vocabulary*
- EN ISO 9001:2015 - *Quality management systems – Requirements*
- EN ISO 9004:2018 - *Quality management - Quality of an organization – Guidelines to achieve sustained success*

#### 4.2.2 Acronyms and glossary

ACRONYMS	DEFINITION TERMS	
GIS	Geographic Information System (Geographic information system or also territorial information system)	Tool that allows to obtain, analyze, represent and interrogate geographic information.

For any other term of an informative nature, reference is made to the mandatory legislation in question and, below, to the voluntary standards (CEN standards, ISO standards, if not in contrast).

### 4.3 Purpose

The purpose of this document is to identify the information requirements of the organization by providing useful information to the subsequent documents on Asset and Project requirements (AIR – PIR) and for the drafting of manuals on Asset and Project models (AIM – PIM).

### 4.4 Information structure of GIS maps

*Describe here if the Organization equipped with GIS maps useful for its activities.*

*If the Organization is not equipped, explain here how the It retrieves information about the territory.*

For example, the Organization could retrieve the data and information relevant to the areas of interest from the urban planning information provided by the specific Municipality of reference; subsequently, once the area of intervention has been defined, through surveys and analysis, it establishes a starting information base to which reference should be made.

The reference coordinates of each land and property considered can be inserted in the following scheme:

REFERENCE SYSTEM	
Point ID	
X	
Y	
Z	

## 4.5 Information structure of the documents

*Describe the flow of the design works developed by Organization starting from the maps described above*

List ere the works referred to for this purpose

For example: Cad relief; Point cloud relief; Other...

## 4.6 GIS object library information structure

*Describe here the GIS object libraries used by the Organization.*

## 5 Asset Information Guidelines (AIL)

### 5.1 Introduction

This document is Annex B to the OIL - Organization Information Guidelines regarding the Asset Level.

The Asset Information Guidelines (AIL) is also completed through the Asset Information Requirements (AIR) and the Asset Information Model (AIM), which are also annexes of the OIL (to B1 and B2).

Please note that the general information flow is shown in Fig. 1 of the Organization Information Guidelines – OIL.

#### 5.1.1 Regulatory references

##### 5.1.1.1 Standards

Reference is made to the following Standards:

- EN ISO 19650-1:2018 - *Organization and digitization of information about buildings and civil engineering works, including Building Information Modelling (BIM) - Information management using Building Information Modelling - Part 1: Concepts and principles*
- EN ISO 19650-2:2018 - *Organization and digitization of information about buildings and civil engineering works, including Building Information Modelling (BIM) - Information management using Building Information Modelling - Part 2: Delivery phase of assets*
- ISO 55000: 2014 Asset management – Overview, principles and terminology
- ISO 55001: 2014 Asset management – Management systems – Requirements

#### 5.1.2 Acronyms and glossary

ACRONYMS	DEFINITION TERMS
	<p>Asset</p> <p>English term that indicates, in a very broad sense, any material or immaterial entity susceptible to economic evaluation for a certain subject. In the absence of a satisfactory classification, the classic distinction between tangible and intangible assets can be used. Among the first are land, crops (vineyards, orchards, etc.), buildings for residential use (homes), industrial (factories, warehouses) or commercial (shops, offices), machinery, tools, raw materials, semi-finished products, products; among the latter, trademarks, patents, concessions. Increasingly, however, the rights related to the use and exploitation of assets, whether tangible or intangible, are concentrated in financial securities representing the rights themselves. In recent times, the range of securities has expanded considerably: alongside the classic ones, such as shares and</p>

		bonds, private or issued by states or other public institutions, there are now stock indices, currencies, closed-end or open-ended mutual funds and derivative assets. The latter are assets whose value depends (derives) on that of an underlying asset (→ derivative). Counterpart of the asset are the liabilities, or the passive items of a balance sheet.
	Asset management	<p>A selection technique (also called a. allocation), conducted individually or by classes in such a way as to achieve the best risk-return combination of the portfolio of assets resulting from such selection. Among the classes are distinguished: cash or equivalents such as money market funds, fixed income assets (such as bonds and multi-year treasury bills), shares, real estate, precious metals, natural resources, currencies, derivatives, insurance products.</p> <p>measure of capacity and the ability of an entity (system, person or organization to achieve its objectives) (ISO 55000:2014)</p>
CDE	Common Environment Data	Agreed source of information for any given project or asset, for collecting, managing and disseminating each information container through a managed process (ISO 19650)
Data Room	Document Environment Sharing	Paper archive, for the sharing of non-digital documents, referring to a single work or a single set of works.
CDE Manager	Manager of the common data environment	The CDE Manager relates the contents of the models with other data on the platform, control the interoperable information process, check the correctness and timeliness of the information flow and apply data protection techniques
BIM Manager	Manager of the digitalized information process	<p>The BIM manager operates at the level of the organization, with regard to the digitization of processes.</p> <p>The BIM manager, in collaboration with the BIM coordinator, collaborates with the CDE manager, even when the latter belongs to a third party organization, taking into account the evolution of the environment from document sharing to data processing.</p> <p>The BIM manager works with the project manager, as part of the integrated management of information processes and decision-making processes.</p>
BIM Coordinator	Coordinator of digitalized information flows	The BIM coordinator operates at the level of the individual order, in line with the top management of the organization and according to the indications of the BIM manager in the overall management of digitalized processes.



BIM Specialists	Advanced operator of information management and modeling	The BIM specialist acts within the individual orders and operates through certain digitalized procedures through object modeling. It interfaces mainly with the BIM coordinator for the coordination and validation of the models and with the BIM manager to identify the instrumental resources useful for carrying out the order
	Code Checking	Verification and control of geometric interferences between objects, models and works from different disciplines.
	Clash Detection	Verification and regulatory control (geometric / alphanumeric), on the models considered, through rule-set (set parametric rules).

For any other term of an informative nature, reference is made to the mandatory legislation in question and, below, to the voluntary standards (CEN standards, ISO standards, if not in contrast).

## 5.2 Purpose

The purpose of this document is to identify the activities, flows and tools used within the asset area of the Organization

## 5.3 Activities

### 5.3.1 Information benchmark

*Benchmark here your organization (Describe the activities of the organization and how it is collocated in the market)*

*Describe the focus/core activities of the Organization*

For the table concerning information barriers, please also refer to the homonymous paragraph of the Organization Information Guidelines – OIL.

The digitalization of the information system brings advantages to the entire asset area, which can be summarized through the SWOT analysis shown in the following table:

**Table 10: Swot Analysis**

INTERNAL FACTORS	STRENGTHS (S)	WEAKNESSES (W)
EXTERNAL FACTORS	OPPORTUNITY (O)	THREATS (T)

### 5.3.2 Products and services

*Describe here how the Organization offers management and maintenance service of buildings and land*

For example, through Management/Asset Models

## 5.4 Relational organization chart of asset management

### 5.4.1 Organization chart of management information roles

*Describe in the following table the organization chart relating to the roles and management information functions related to the Asset of the Organization.*

Regarding the organization chart presented above insert in the following table the information requested.

ROLE	NAME	EMAIL	TELEPHONE	ACTIVITY
CDE Manager				The CDE manager confronts the BIM Manager and the BIM Coordinator for the structuring of the CDE. The CDE manager manages the data sharing platform.
BIM Manager				The BIM Manager establishes the information rules for asset management.
BIM Coordinator				The BIM Coordinator receives the information from the BIM Manager and coordinates the activities of the BIM Specialists.
BIM Specialist ARCH				BIM Specialists follow the directives of the BIM coordinator and develop the model
BIM Specialist STR				
BIM Specialist MEP				

### 5.4.2 Matrix of information responsibilities

*Indicate in the following table (RACI matrix) the responsibilities of each role identified in the previous paragraph.*

**Table 11: RACI matrix**

ACTIVITY (below are examples)	CDE manager	BIM manager	BIM coordinator	BIM Specialist ARCH	BIM Specialist STR	BIM Specialist MEP
Definition of information rules						
Incoming documentation verification						
Check outbound documentation						
Approval						
Clash/Code on coordinated models						
Clash/Code on individual models						
Model development						
EIR and BEP						

R = Responsible

A = Accountable

C = Consulted

I = Informed

## 5.5 Information flows of asset management

### 5.5.1 External information flows

*Insert below a graph (and explain it) that shows the flow followed for the start of asset management activities between the Organization and the external parties involved during the process.*

### 5.5.2 Internal information flows

*Insert below a graph (and explain it) that shows the internal information flow of Organization in reference to asset management.*

### 5.5.3 Coordination flows

During the Asset management phase, the only activity to be carried out is to "connect" useful documents during the management phase to the model developed for this purpose.

However, it is necessary and useful to check that, for example:

- The model is correctly exported in IFC 2X3 format;
- The model exported contains Premises and Real Estate Units;
- Each object is correctly linked to the necessary technical documentation;
- Other...

#### 5.5.4 Verification flows

Each asset model is subjected to a verification process whenever there are changes to the initial conditions (internal / external restructures, etc.). Each verification must follow the instructions specified in the homonymous paragraph of the Project Information Guidelines– PIL.

### 5.6 Dedicated tools in asset management

#### 5.6.1 Hardware tools

The following table shows the hardware tools used by the organization:

HARDWARE		
Nr.	Typology	Prevailing features
	e.g. Fixed Workstation	
	e.g. Monitor	
	e.g. NAS	
	e.g. Multifunction printer	
	e.g. Unsevered power supply	

#### 5.6.2 Software Tools

Insert in the following table shows the software tools used by the Organization:

**Table 12: Software used by the organization**

SOFTWARE				
Utilization	Model	Brand	Version	Number of workstations

## 6 Asset Information Requirement (AIR)

### 6.1 Introduction

This document represents Annex B1 to the OIL - Organization Information Guidelines regarding the Asset Level.

The Asset Information Requirement (AIR) is also completed through the Asset Information Guidelines (AIL) and the Asset Information Model (AIM), which are also annexes of the OIL (to B and B2).

Please note that the general information flow is shown in Fig. 1 of the Organization Information Guidelines – OIL.

#### 6.1.1 Regulatory references

##### 6.1.1.1 Standards

Reference is made to the following Standards:

- EN ISO 19650-1:2018 - *Organization and digitization of information about buildings and civil engineering works, including Building Information Modelling (BIM) - Information management using Building Information Modelling - Part 1: Concepts and principles*
- EN ISO 19650-2:2018 - *Organization and digitization of information about buildings and civil engineering works, including Building Information Modelling (BIM) - Information management using Building Information Modelling - Part 2: Delivery phase of assets*
- ISO 55000: 2014 Asset management – Overview, principles and terminology
- ISO 55001: 2014 Asset management – Management systems – Requirements

#### 6.1.2 Acronyms and glossary

ACRONYMS	DEFINITION TERMS	
	Objective	The specific purpose for which the model or object is requested. Ex: obtaining authorizations, documentation concerning the fire brigade, information necessary for the economic evaluation of the project, etc.
	Use	Specific use of the data and information enclosed in the model or object. Ex: extraction of information related to materials, dimensions, quantities, etc.
	Model	Information vehicle for the virtualization of products and processes in the construction sector. (EN ISO 19650)
	Object	Virtualization of geometric and non-geometric attributes of finite spatial entities, related to a work, or to a complex of works, and their processes. (EN ISO 19650)
	Delivery	Transfer of data, information or documents intended as a result of an activity and transmitted at a specific time.

LOIN	Level of Information Need	Framework which defines the extent and granularity of information (EN ISO 19650-1:2018)  LOIN= LOG+LOI+DOC LOIN= LOD+DOC
LOD	Level of development of digital objects	Level of depth and stability of the data and information of the digital objects that make up the models. For uniformity with the terminology adopted in the international field, "LOD" is used as find in the English language "Level of Development". (EN ISO 19650)  LOD= LOG+LOI
LOI	Information level of objects – geometric attributes	Level of depth and stability of the geometric attributes of the digital objects that build up models. It is part of the LOD, together with the LOI, referring to the geometric attributes. (EN ISO 19650)
LOG	Information level of objects – informational attributes	Level of depth and stability of the information attributes of the digital objects that make up models. It is part of the LODs, together with the LOGS, referring to the non-geometric attributes. (EN ISO 19650)
DOC	Information level of documents	Level of depth of the input documents for the drafting of the models and of output from the models themselves.

For any other term of an informative nature, reference is made to the mandatory legislation in question and, below, to the voluntary standards (CEN standards, ISO standards, if not in contrast).

## 6.2 Purpose

The purpose of this document is to identify the information requirements necessary for the asset area of the organization. The goal is to group all the information into a single document.

## 6.3 Information structure, Operating LOIN

List below the phase objectives (LOIN) with reference to the operating status.

**Table 13: Phase objectives (LOIN)**

STATE	PHASE	OBJECTIVE
e.g. Exercise	e.g. Management and Maintenance	e.g. Maintenance – Maintenance design criteria

## 6.4 Information structure, operating model LOIN

### 6.4.1 Objectives and uses of model

*Describe in the table the management model used by the Organization for the development of assets, with the objectives and uses.*

**Table 14: Management Model used**

MODEL	OBJECTIVES	USES
e.g. Architectural	e.g. Have a model full of useful information for the management of the building (rooms, surfaces, etc...)	e.g. Extract surfaces; Extract areas (real estate unit); Extract maintenance dates; Other...
e.g. Structural		
e.g. MEP		

### 6.4.2 Preparatory activities

To start a real estate management intervention, it is necessary (prior to the feasibility study and, therefore, to the final and executive design) to have the documentation to verify the administrative regularity of the buildings or of the land on which to plan the intervention.

*Insert in the following the needed documentation for the drafting of the model of the state of affairs:*

- ...
- ...
- ...

### 6.4.3 Delivery

The deliveries planned by Organization for the management of assets are:

For example:

- Management model (financial management, costs, revenues, leases, etc.)
- Maintenance model (technical management, etc.)

### 6.4.4 Model documents (DOC)

*Insert in the following table the documents extracted (e) or linked (l) to the Asset model.*

**Table 15: Asset model documents**

MODEL	DOCUMENT	CODE	
Architectural			

Architectural/ Structural/ Plant Engineering			
Legend <div> e document extrapolated from model  c document related to the model </div>			

Since this is a management model, specific drawings/documents will not be extracted from it, rather they will be linked to the platform used.

For more clarification on the structuring of the CDE, please refer to Annexes E1 of the Organization Information Guidelines – OIL.

All useful documents at this phases must be linked to the objects to which they refer directly through the platform viewer.

## 6.5 Information structure, LOIN of operating objects

### 6.5.1 Objectives and uses of objects

The aim of digital objects in the operating phase is to guarantee the functionality of each element in the useful life cycle and its possible disposal and replacement; as well as understand the consequent costs and consumption.

In the operating phase, the use of digital objects is to ensure the extraction of information needed for the technical / economic management of the property.

*Define the attributes needed for the objects.*

- ...
- ...
- ...

### 6.5.2 Object processing

Each object of the asset model must be linked through links and attributes to the following useful documents during the management phase:

*List the documents*

- ...
- ...
- ...



## 7 Asset Information Model (AIM)

### 7.1 Introduction

This document represents Annex B2 to the Information Management Guidelines – OIL with respect to the Asset level.

The Asset Information Model (AIM) is also completed through the Asset Information Guidelines (AIL) and the Asset Information Requirements (AIR), which are also annexes of the OIL (B and B1).

Please note that the general information flow is shown in Fig. 1 of the Organization Information Guideline – OIL.

#### 7.1.1 Regulatory references

##### 7.1.1.1 Standards

Reference is made to the following Standards:

- EN ISO 19650-1:2018 - *Organization and digitization of information about buildings and civil engineering works, including Building Information Modelling (BIM) - Information management using Building Information Modelling - Part 1: Concepts and principles*
- EN ISO 19650-2:2018 - *Organization and digitization of information about buildings and civil engineering works, including Building Information Modelling (BIM) - Information management using Building Information Modelling - Part 2: Delivery phase of assets*
- ISO 55000: 2014 Asset management - Overview, principles and terminology
- ISO 55001:2014 Asset management - Management systems - Requirements

#### 7.1.2 Acronyms and glossary

ACRONYMS	DEFINITION TERMS	
	Object libraries	Digital environment for organized collection and sharing of objects for graphic and alphanumeric models.
	Informative paper	An information process is defined as the vehicle for the representation and contractualization of a product or a process in the construction sector through information content of a graphic, documentary (alphanumeric), multimedia... The information papers are divided into: <ul style="list-style-type: none"> <li>- Graphs (graphic representation: drawings, technical tables, etc.);</li> <li>- Documentary (alphanumeric representation: relationships, calculations, contracts, etc.);</li> <li>- Multimedia (multimedia representation: audio, photos, movies, etc.).</li> </ul> (EN ISO 19650)
	Information model (or model)	An information model is defined as the vehicle for the simulation and contracting of a resulting product or a process in the construction sector, through

		information content of a graphic, documentary (alphanumeric) and multimedia nature.
--	--	---

For any other term of an informative nature, reference is made to the mandatory legislation in question and to the voluntary standards (CEN standards, ISO standards, if not in contrast).

## 7.2 Purpose

The purpose of this document is to identify the information structure of the models, papers, and library of objects produced for the Organization's Asset.

## 7.3 Information structure of graphic models

### 7.3.1 Modelling rules

The Asset model is a model that follows the same principles as a project model (maximum file size, coordinate system, insertion of objects, attributes); but differs from the latter for the type of information that populated it. The Asset model, in fact, is configured as an As-built model unloading of the data necessary in the design / construction phase and superfluous in the management phase (example: number of steel reinforcing bars, etc.).

### 7.3.2 Architectural Asset Model

The Architectural Asset Model must be generated starting from an As-built model contained within the CDE.

The As-built Model must undergo the following changes to become an Asset Model:

*List the changes (if any)*

- ...
- ...
- ...

### 7.3.3 Structural and Plant Asset Model

With regard to the management of structural or plant parts, the Asset model referred to these disciplines will be generated and will undergo the same processes described for the Asset Model.

#### 7.3.3.1 Maximum size of modelling files

The developed models, as described in the previous paragraph, have a minimum size of xx MB and a maximum of xx MB.

#### 7.3.3.2 Common system of coordinates and reference specifications

In the Master Model, the coordinate system received through the survey must be used. By way of example, there is a useful table to specify the coordinates to be used:

**Table 16: Master model coordinate system**

ABSOLUTE REFERENCE SYSTEM	
Argument	Specification
Intersection grids XX and YY	...
Altitude	
Rotation from true north	
Ground floor PPF	
...	
OTHER PROPOSED REFERENCES	
Argument	Specification
Origin of the axis system	
Offsets and distances between axes	
Encoding axes or grids	
Units of measurement	
...	

### 7.3.4 3.1.3 Specific for inserting digital objects into models

All asset models must be developed from an as-built model derived from the Project area. Each object, therefore, will follow modelling criteria that allow its easy reading, interrogation and subsequent re-elaboration. In particular (in all cases where possible) the elements parametrization rules must be respected by introducing geometric constraints.

### 7.3.5 Model encoding

*Insert here the coding developed by the Organization for the asset management*

...

### 7.3.6 Model attributes

*Describe here the format (IFC, for example) used for the Asset Templates uploaded to the platform.*

## 7.4 Information structure of the documents

### 7.4.1 Elaborations generation

*Explain here if no specific drawing must be extrapolated from the Asset Model and Each information can be accessed directly by querying the model in the platform.*

### 7.4.2 Processed coding

Since there are no drawings extracted directly from the model, there is no specific and dedicated coding.

## 7.5 Object library information structure

### 7.5.1 Object modelling rules

*Describe here the object modelling rules (explain, for example, if the objects derive from the design model then as-built and, finally, useless information removed during the management phase and which format is used (e.g. IFC).*

### 7.5.2 Coding of the objects

*Describe here the coding of the objects (if the Organization does not directly produce objects, refer to the coding proposed by the appointed party which must in any case be communicated and discussed in time).*

### 1.1.2 Geometric attributes (LOG)

*Describe here the level of geometric detail characterizing the objects with reference to management and maintenance.*

*Insert in the following table (by way of example) the useful and necessary information for this phase:*

GEOMETRIC ATTRIBUTES	
•	...
•	...
•	...

### 7.5.3 Non-geometric attributes (LOIs)

*Describe here the level of non-geometric attributes characterizing the objects with reference to management and maintenance.*

*Insert in the following table (by way of example) the useful and necessary information for this phase.*

**Table 17: Non-geometric attributes**

NON-GEOMETRICS ATTRIBUTES	
•	...
•	...
•	...

Each Asset model must be characterized by the presence of links referring to spreadsheet tables containing all the information concerning

- ...

### 7.5.4 Libraries outside the organization

*Describe/explain here if the Organization use objects from external libraries specifying the origin of the libraries.*

## 8 Project Information Guidelines (PIL)

---

### 8.1 Introduction

This document represents Annex C to the OIL Organization Information Guidelines. The Project Information Guidelines (PIL) is also completed through the Project Information Requirements (PIR) and the Project Information Model (PIM), which are also annexes of the OIL (C1 and C2).

Please note that the general information flow is shown in Fig. 1 of the Organization Information Guidelines – OIL. In addition, all project indications derive from the information flow of Asset (AIL, AIR, AIM).

#### 8.1.1 Regulatory references

##### 8.1.1.1 Standards

Reference is made to the following Standards:

- EN ISO 19650-1:2018 - *Organization and digitization of information about buildings and civil engineering works, including Building Information Modelling (BIM) - Information management using Building Information Modelling - Part 1: Concepts and principles*
- EN ISO 19650-2:2018 - *Organization and digitization of information about buildings and civil engineering works, including Building Information Modelling (BIM) - Information management using Building Information Modelling - Part 2: Delivery phase of assets*

### 8.1.2 Acronyms and glossary

Find below the acronyms used and a synthetic glossary of the relative terms related to BIM and the digitization of the construction sector in the design of the interventions:

ACRONYMS	DEFINITION TERMS	
BIM	Building Information Modelling	“Use of a shared digital representation of a built asset to facilitate design, construction and operation processes to form a reliable basis for decisions” (EN ISO 19650-1:2018)
WBS	Working Breakdown Structure	Tree structuring of activities for programming.
CPM	Critical Path Method	Critical path method.
...	...	...

For any other term of an informative nature, reference is made to the mandatory legislation in question and to the voluntary standards (CEN standards and ISO standards, if not in contrast).

## 8.2 Purpose

The purpose of this document is to identify the activities, organizational charts, flows and information tools in reference to the design of the interventions (from restructuring, demolition and reuse).

## 8.3 Activities

### 8.3.1 Information benchmark

*Describe/Explain here if the Organization deals with design and/or controls and verifies externally commissioned projects.*

In the case of projects commissioned externally, list here the external reference organizations:

- ...
- ...
- ...

For the table concerning information barriers, please also refer to the homonymous paragraph of the Organization Information Guidelines – OIL.

The use of BIM information models brings advantages that can be summarized through the SWOT analysis shown in the following table:

**Table 18: BIM Models SWOT analysis**

INTERNAL FACTORS	STRENGTHS (S)	WEAKNESSES (W)
EXTERNAL FACTORS	OPPORTUNITIES (O)	THREATS (T)

### 8.3.2 Products and services

*Describe here the products and services offered by the Organization:*

- ..
- ..
- ..



## 8.4 Relational organization chart of project management

### 8.4.1 Organization chart of the information roles of intervention

*Insert in the following table the organization chart relating to the information roles.*

**Table 19: Information roles organization's chart**

ROLE	NAME	EMAIL	TELEPHONE	ACTIVITY
CDE manager				
BIM manager				
BIM coordinator				
BIM Specialist				

### 8.4.2 Matrix of information responsibilities (RACI)

*Insert in the table below the responsibilities of each role identified in the previous paragraph.*

**Table 20: RACI matrix**

ACTIVITY	CDE manager	BIM manager	Project Manager	BIM coordinator	BIM Specialist ARCH	BIM Specialist STR	BIM Specialist MEP
Definition of information rules							
Incoming documentation verification							
Check outbound documentation							
Approval							
Clash/Code on coordinated models							
Clash/Code on individual models							
Model development							

ACTIVITY	<i>CDE manager</i>	<i>BIM manager</i>	<i>Project Manager</i>	<i>BIM coordinator</i>	<i>BIM Specialist ARCH</i>	<i>BIM Specialist STR</i>	<i>BIM Specialist MEP</i>
EIR and BEP							

R = Responsible

A = Accountable

C = Consulted

I = Informed

## 8.5 Information flows of project management

### 8.5.1 External information flows

*Insert below the diagram representing the external information flow of the Organization*

### 8.5.2 Internal information flows

*Insert below the diagram representing the internal information flow of the Organization*

...

### 8.5.3 Coordination flows

The data and information enclosed in the models (belonging to a given digital process) must be coordinated with the reference rules. This coordination (in the same model or between graphic models of the various disciplines) must take place through the verification of interference (clash detection) and relative solutions of any inconsistencies (code checking) found.

For **Code Checking**, traditional checks must be carried out also referring to the following matrix:

#### 8.5.4 Verification flows

Organization takes care to carry out the level of internal verification by the BIM Coordinators for each model or drawing produced and by the BIM Manager on sample before their issue to third parties.

## 8.6 Dedicated tools in project management

### 8.6.1 Hardware tools

The following table shows the hardware tools used by Organization:

### Table 21: Hardware tools

HARDWARE		
Nr.	Typology	Prevailing features
	Fixed Workstation	
	Monitor	
	NAS	
	Notebook	
	Telecom Italia Business Network	
	Multifunction printer	
	Unsevered power supply	

### 8.6.2 Software Tools

The following table shows the software tools used by Organization

### Table 22: Software tools

[illegible]

## 9 Project Information Requirements (PIR)

---

### 9.1 Introduction

This document represents Annex C1 to the OIL - Organization Information Guidelines. The Project Information Requirement (PIR) is also completed through the Project Information Guidelines (PIL) and the Project Information Model (PIM), which are also annexes of the OIL (annex C and annex C2).

Please note that the general information flow is shown in Fig. 1 of the Organization Information Guidelines – OIL. In addition, all project indications derive from the information flow of Asset (AIL, AIR, AIM).

#### 9.1.1 Regulatory references

##### 9.1.1.1 Standards

Reference is made to the following Standards:

- EN ISO 19650-1:2018 - *Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 1: Concepts and principles*
- EN ISO 19650-2:2018 - *Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 2: Delivery phase of the assets*
- EN ISO 19650-3:2020 - *Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 3: Operational phase of the assets*
- EN ISO 19650-5:2020 - *Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 5: Security-minded approach to information management*

### 9.1.2 Acronyms and glossary

Fill the table with the acronyms used and with the synthetic glossary of the relative terms related to BIM and the digitization of the construction sector in the design of the interventions (or refer to the acronyms and glossary section of the OIL).

**Table 23: List of acronyms**

ACRONYMS	DEFINITION TERMS

For any other term of an informative nature, reference is made to the mandatory legislation in question and, below, to the voluntary technical standard (CEN standards and ISO standards, if not in contrast).

## 9.2 Purpose

The purpose of this document is to identify the information structure for intervention projects, models and objects.

## 9.3 Information structure, design LOIN

### 9.3.1 Process Phase Objectives

**Table 24: Project phase objectives**

PHASE	PHASE OBJECTIVES
Initiative	
Initiation	
Design: concept	
Design: preliminary	
Design: developed	
Design: detailed	
Construction	
Building use	
End of life	

### 9.3.2 Project objectives

**Table 25: Project objectives**

PHASE	PROJECT OBJECTIVE
Initiative	
Initiation	
Design: concept	
Design: preliminary	
Design: developed	
Design: detailed	
Construction	
Building use	
End of life	

## 9.4 Information structure, project template LOIN

### 9.4.1 Objectives and uses of model

**Table 26: Model objectives and uses**

PHASE	MODELS	OBJECTIVE	USES
Initiative			
Initiation			
Design: concept			
Design: preliminary			
Design: developed			
Design: detailed			
Construction			
Building use			
End of life			

### 9.4.2 Preparatory activities

To start the design activity the following information are needed in advance (list the information needed):

- ...
- ...
- ...

### 9.4.3 Deliveries

During the determination of the modeling specifications, a delivery plan must be defined where the following information will be identified:

- Definition of Delivery Type  
By way of example, some types of delivery are listed:
  - Graphic Templates
  - Graphic elaborations extracted from the model
  - Graphics not extracted from the model
  - Documentary documents not extracted from the model
  - Clash Reports
  - Other...
- Delivery support  
Deliveries must be made available through:
  - CDE Sharing
  - Other...

### 9.4.4 Drawing of the model (DOC)

**Table 27: Extrapolation table of the drawings to be developed for the design phase.**

MODEL	DRAWING	TABLE CODE	
Architectural			
Structural			
BEM			
Mechanical			
Electrical			
Plumbing			
Safety			

legend

- e drawing extrapolated from model
- c drawing associated to the model

## 9.5 Information structure, LOIN of project objects

### 9.5.1 Objectives and uses of objects

PHASE	OBJECT	OBJECTIVE	USES
Initiative			
Initiation			
Design: concept			
Design: preliminary			
Design: developed			
Design: detailed			
Construction			
Building use			
End of life			

### 9.5.2 Object processing

Each object will be linked through links and attributes to the following works:

**Table 28: Objects links and attributions**

PHASE	OBJECT	OBJECTS DRAWINGS
Initiative		
Initiation		
Design: concept		
Design: preliminary		
Design: developed		
Design: detailed		
Construction		
Building use		
End of life		



## 10 Project Information Model (PIM)

---

### 10.1 Introduction

This document represents Annex C2 to the OIL - Organization Information Guidelines. The Project Information Model (PIM) is also completed through the Project Information Guidelines (PIL) and the Project Information Requirements (PIR), which are also annexed entities of the OIL (C and C1).

Please note that the general information flow is shown in Fig. 1 of the Organization Information Guidelines – OIL. In addition, all project indications derive from the information flow of Asset (All, AIR, AIM).

#### 10.1.1 Regulatory references

##### 10.1.1.1 Standards

Reference is made to the following Standards:

- EN ISO 19650-1:2018 - *Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 1: Concepts and principles*
- EN ISO 19650-2:2018 - *Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 2: Delivery phase of the assets*
- EN ISO 19650-3:2020 - *Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 3: Operational phase of the assets*
- EN ISO 19650-5:2020 - *Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 5: Security-minded approach to information management*

### 10.1.2 Acronyms and glossary

Find below the acronyms list used and a synthetic glossary of the relative terms related to BIM and the digitalization of the construction sector in the design of the interventions:

**Table 29: List of acronyms**

ACRONYMS	DEFINITION TERMS	
IFC	Industry Foundation Classes	Open language for saving and exchanging data for graphic models. ( EN ISO 16739:2016)
XML	eXtensible Markup Language	Language that allows the representation of documents and structured data on digital support.
	Systems	Technological, tangible part of a work. More or less articulated composition of subsystems combined with each other due to the common correspondence to an aggregating function. Generally differentiated in construction or architectural systems, structural systems, plant systems, environmental systems. Examples of systems are: the internal walls and the outer shell of a building, the floors, the roofs intended as finished packages. The road massif, the air conditioning system, the elevation structures. (EN ISO 19650-1: 2018)
	Subsystems	Technological, tangible part of a system belonging to a work. More or less articulated composition of individual components combined with each other due to the common correspondence to an aggregating function. It performs its own characterizing function and is part of a system, performing (or helping to perform) one or more specific functions. Generally differentiated into construction or architectural subsystems, structural subsystems, plant subsystems, environmental subsystems. Examples of subsystems are: the plaster layer, the insulating layer, screeds, etc. understood as functional layers or parts of finished packages. The tout-venant of the road massif, the distribution network of the air conditioning system, the pillar or beam of the elevation structures. (EN ISO 19650-1: 2018)

For any other term of an informative nature, reference is made to the mandatory legislation in question and, below, to the voluntary standards (CEN standards and ISO standards, if not in contrast).

## 10.2 Purpose

The purpose of this document is to identify the information structure of graphic models, drawings and object libraries.

## 10.3 Information structure of graphic models

Describe how to create the models useful to the Organization.

### 10.3.1 Modelling rules

#### 10.3.1.1 Maximum size of modelling files

The developed models have a minimum size of *xx MB* and a maximum of *xxx MB (insert the values)*.

#### 10.3.1.2 Common system of coordinates and reference specifications

In the Master Model you will use the coordinate system indicated and received through the survey. By way of example, employ the following table to specify the coordinates to be used.

**Table 30: Reference systems**

ABSOLUTE REFERENCE SYSTEM	
Argument	Specification
Intersection grids XX and YY	...
Altitude	
Rotation from true north	
Ground floor PPF	
...	
OTHER PROPOSED REFERENCES	
Argument	Specification
Origin of the axis system	
Offsets and distances between axes	
Encoding axes or grids	
Units of measurement	
...	

#### 10.3.1.3 Specific for inserting digital objects into models

All graphic models must be built up by applying methods that allow their easy reading, querying and subsequent reprocessing. The rules for a correct parameterization of the elements must be respected by introducing the proper geometric constraints. Each object shall be characterised so that at least the following basic information is legible or can be traced back to it, for example:

- All objects inserted within the graphic model must be related with the class of belonging (by the specific discipline);
- All machines and plant engineering devices must be modelled with the exact position of the joints and passages (where provided for by the reference LOD) with respect to the real element.
- Ecc.

### 10.3.2 Model encoding

*Describe/Represent in a table or image the coding that the models developed must follow.*

**Table 31: Example of drawings coding**

CODE	DESCRIPTION	NUMBER OF DIGITS or LETTERS
PROPERTY CODE	Describes the property	3 DIGITS
LEVEL	Indicates the level (plan)	3 LETTERS
FILE TYPE	Indicates whether it is a three-dimensional model, a calculation relationship, an operational specification, etc.	2 LETTERS
DISCIPLINE	...	...
DESIGN PHASE	...	...

### 10.3.3 Models attributes

Report in the following list the geometric attributes of graphic models related to design:

For example

- Address
- Coordinates
- Property
- Client
- Designers
- Other...

## 10.4 Information structure of the documents

### 10.4.1 Drawings generation

All graphic drawings must be extracted from the model. For unmodeled parts, 2D parts linked to the model must be made.

For non-graphic drawings (EN ISO 19650-1:2018) any data present and / or extractable without duplication must be extracted from the models.

### 10.4.2 Drawings coding

The drawings developed for the design by Organization follow the coding below (insert table/ image).

...

## 10.5 Object library information structure

### 10.5.1 Object modelling rules

*Describe how to create the objects to be enclosed in the models.*

### 10.5.2 Encoding objects

*The objects developed for design by the Organization follow the coding below.*

..

### 10.5.3 Geometric attributes (LOG)

All objects produced for design are characterized by a level of detail necessary and useful for the development phase of the project. By way of example, some possible information related to objects must be shown in the following table:

**Table 32: geometric attributes**

GEOMETRIC ATTRIBUTE
<ul style="list-style-type: none"> <li>• ...</li> <li>• ...</li> <li>• ...</li> </ul>

### 10.5.4 Non-geometric attributes (LOIs)

The non-geometric attributes related to the object are, for example, those referring to the technical characteristics of the object or to the correct maintenance and management. By way of example and not exhaustively, the following the useful and necessary information for the various phases must be shown in the following table:

**Table 33: non geometric attributes**

NON-GEOMETRIC ATTRIBUTE
<ul style="list-style-type: none"> <li>• ...</li> <li>• ...</li> <li>• ...</li> </ul>

### 10.5.5 Libraries outside the organization

*Specify any external libraries used.*

## 11 Exchange Information Requirements (EIR)

### 11.1 Introduction

This document is Annex D to the OIL - Organization Information Guidelines.

#### 11.1.1 Regulatory references

This document originates and is inspired by the provisions of the mandatory and technical regulations related to the field of digitization in the construction sector. Therefore, in the following paragraphs the regulatory references taken into analysis are analyzed in detail.

##### 11.1.1.1 Voluntary standards

For each principle of a technical nature the main references are the standards:

- EN ISO 19650:2018
  - Parts 1, 2;
  - prEN 17412:2020

In terms of software languages and BIM open formats the main references are the standards:

- EN-ISO 16739:2016,
- Industry Foundation Classes (IFC).

In terms of privacy and security of digital data, digital archives, data retention, digital signature, encryption, use of the internet, web portals and e-mail – certified, the main references are

- GDPR, EU 2016/679;
- EN ISO 19650.

#### 11.1.2 Acronyms and glossary

For the purposes of the EIR, the list of acronyms used and a synthetic glossary of the terms relating to BIM and the digitization of the construction sector are reported in the following table.

**Table 34: List of acronyms and glossary**

<i>Acronyms</i>	<i>Terms Definitions</i>
	Appointing party “receiver of information concerning works, goods or services from a lead appointed party” (EN ISO 19650-1:2018)
	Appointed party “provider of information concerning works, goods or services” (EN ISO 19650-1:2018)
	Client “actor responsible for initiating a project and approving the brief

	Information		reinterpretable representation of data in a formalized manner suitable for communication, interpretation or processing” (EN ISO 19650-1:2018)
BIM	Building Modeling	Information	Use of a shared digital representation of a built asset (3.2.8) to facilitate design, construction and operation processes to form a reliable basis for decisions (EN ISO 19650-1:2018)
EIR	Exchange Requirements	Information	Explanation of the needs and information requirements required by the Client / Appointing party for the execution of a contract for works, supply or services (ISO 19650-1:2018)
	BIM Execution Plan		“Plan that explains how the information management aspects of the appointment will be carried out by the delivery team.” (ISO 19650-1:2018)
IDP	Information Delivery Plan		The planning of the delivery of information is under the responsibility of each principal appointed party. Plans should be formulated in response to the information requirements set by the Appointing party and should reflect the purpose and scope of the assignment throughout the life cycle of the property asset. (EN ISO 19650-1:2018)
LOIN	Level of Information Need		framework which defines the extent and granularity of information (EN ISO 19650-1:2018)
CDE	Common Data Environment		Agreed source of information for any given project or asset, for collecting, managing and disseminating each information container through a managed process (EN ISO 19650-1:2018)
DB	Database		Structured data stored in a computer in order to rationalize the updating and management of information and allow the execution of complex searches.
DBMS	Database System	Management	Data Base Management System (Software).
ERP	Enterprise Planning	Resource	Integrated management system of relevant business processes (sales, purchasing, warehouse management, accounting, etc.)
FTP	File Transfer Protocol		Protocol for data transmission with file storage and exchange environments.

ICT	Information Communication Technologies	and	Set of technologies that provide access to information through telecommunications (internet, wireless networks, mobile phones, etc.).
XML	eXtensible Markup Language		Language that allows the representation of documents and structured data on digital support.
IFC	Industry Foundation Classes		Open language for saving and exchanging data for graphic models. (EN-ISO 16739:2016)
WBS	Working Structure Breakdown		Tree (descending) structuring of activities for programming.
CPM	Critical Path Method		Critical path method.
<i>Extra-EU terminology</i>			
<i>Acronyms</i>	<i>Terms</i>	<i>Definitions</i>	
BEP pre-contract	BIM Execution Plan pre-contract	Anglo-Saxon ACRONYM UK of oGI (PAS 1192-2)	
BEP post-contract	BIM Execution Plan post-contract	Anglo-Saxon UK acronym for pGI (PAS 1192-2)	
LOD (USA)	Level of Development	BIM Forum 2016	
LOD (UK)	Level of Definition	PAS 1192-2	
LOI	Level of Information	PAS 1192-2	

For any other term of an informative nature, reference is made to the mandatory reference legislation and, below, to the voluntary technical standard (EN ISO 19650, to the CEN standards and to the ISO standards, if not in contrast).

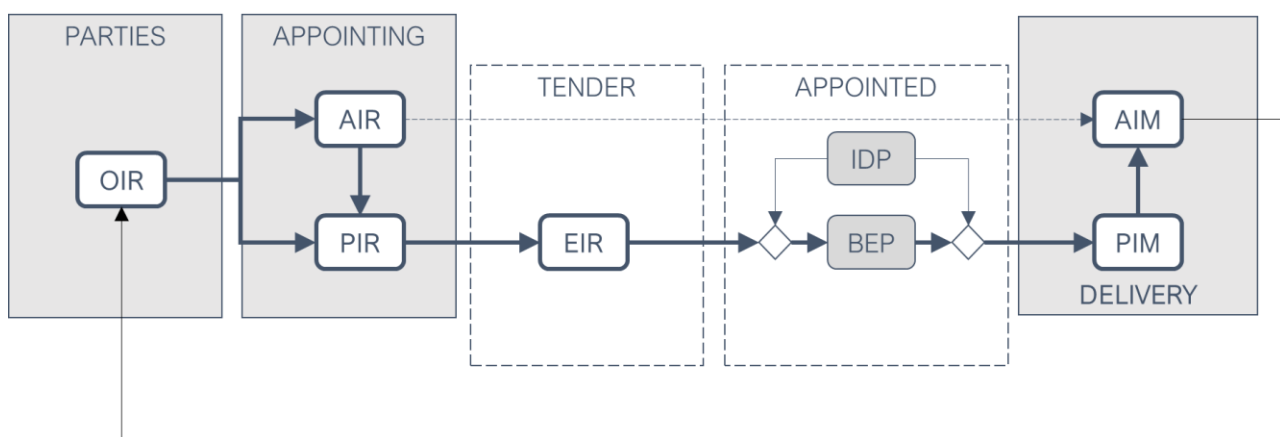


## 11.2 Purpose

The main purpose of this document is to define the requirements for the exchange of information between the appointing party and the appointed party (EN ISO 19650-2:2018).

Therefore, in the paragraphs of which it is composed, the information requirements to be respected for the project in question will be specified, the level of information need, the criteria for accepting each information requirement, ancillary information and the (informative) deadlines established for this project.

The EIR, therefore, is prepared as a general guideline and for the formulation of the BEP pre contract (EN ISO 19650), by the Competitors, and the subsequent Information Management Plan BEP post contract (EN ISO 19650), by the appointed party.



**Figure 3 - Award Information Flow (a.pavan)**

The purpose of the EIR, therefore, is to define in a timely manner the needs and information requirements to which the competitor must respond and consider (binding as contractual minimums) in the development of its offer and report updated in its BIM Execution Plan, in case of award.

The EIR and the BIM Execution plan (BEP pre contract) constitute a minimum contractual constraint for the appointed party.

### 11.2.1 Strategic information objectives of the EIR

This EIR has the strategic information objective of optimizing the interoperability, transparency and adequacy of the data about the order/project in question.

In particular, this contract of ☐ Works ☐ Services ☐ Supplies concerns "... write the subject of the contract...".

The activities covered by this contract are described in detail

- ☐ in the Letter of Invitation to which this EIR is attached.
- ☐ in the Call for Tenders and in the other contractual documents prepared by the appointing party
- ☐ in the Request for Quotation and in the other contractual documents prepared by the by the appointing party
- ☐ Other: "... specify the type of engagement...".

### 11.2.2 Strategic information objectives of the EIR

To achieve the strategic information objectives described in the previous paragraph, it is intended to adopt "BIM methods and tools" (Building Information Modelling) and / or "information modelling", for the digital information management of contracts.

Therefore, for the purposes of the information flow of this contract, in addition to the production of legal and contract documentation will be ☐ mandatory, ☐ positively regarded the deposit on digital support and in the manner set out below of "graphic models" (EN ISO 19650), necessary for the fulfillment of the required information requirements.

#### 11.2.2.1 Contractual prevalence

The EIR as well the BIM Execution Plan are contractual documents.

The EIR is *binding* only for digital information topics, information processes, Hardware and Software digital tools, BIM information modelling (compared to other contractual documents).

The EIR has *an integrative character*, on purely informative issues, with respect to other contractual documents.

In the event of discrepancy, *primarily* ☐ the data and information present ☐ in the Letter of Invitation ☐ in the Notice ☐ in Offer Request ☐ in the Request and of the other contractual documents, prevail over those of the EIR.

As a *secondary step* and with regard to data or information concerning only issues of an informative nature, the EIR and the related BIM Execution Plan prevail over any other tender and procurement document.

#### 11.2.2.2 Identification of the project

The general indications reported in the following table and referring to the order find their exhaustive explanation in all the documentation constituting ☐ the Letter of Invitation ☐ The call ☐ the request of offer ☐ Other to which reference is made for any definition of necessary detail.

**Table 35: Appointing party information**

<i>About the Appointing party</i>	
Appointing party	
Web address	
Call web page	
Protocol Office	
Protocol web page	
Protocol address	
Protocol telephone number	
Protocol e-mail delivery	
Responsible for the Procedure	
Telephone number of the Responsible for the Procedure	

e-mail address of Responsible for the Procedure	
Project Supervisor (PS)	
Telephone number PS	
PS's e-mail address	

<i>About the project</i>	
Project	
Category of Building	
Type of Intervention	
Project Web Page	
Address of the Intervention	
Web page of the construction site	
Telephone number of the construction site	
E-mail address of the construction site	
...	
<i>Brief description of the Project</i>	
See:	Invitation letter
	Needs framework
	Project Initiation Documentation (PID)
	Feasibility Project
	Final Project
	Executive Project
	Maintenance Plan
	...

## 11.3 Technical Section

This section defines the minimum technical reference requirements for the computerization systems to be used in the project with regards to Hardware, Software, data, reference systems, levels of development, skills, etc.

The indications concern, to varying degrees, both the appointing party and the appointed party.

### 11.3.1 HW and SW infrastructure made available by the appointing party

The following paragraphs specify the Hardware (HW) and Software (SW) that the appointing party will make available for the project. Therefore, all the tools (digital and other) provided by the Appointing party for the information flow optimization are considered.

#### 11.3.1.1 Hardware Infrastructure

The following table shows the Hardware infrastructure made available for the project by the appointing party.

**Table 36: Hardware Infrastructure**

<i>Hardware</i>		
<i>Nr.</i>	<i>Typology</i>	<i>Prevailing features</i>
	Server	Language HD
	...	...
	Network	LAN speed Wifi speed
	...	...
	NAS	...

*NOTE: the information contained herein can be found in the OIL, AIL and/or PIL of the appointing party, where present.*

#### 11.3.1.2 Software Infrastructure

The following table shows the Software infrastructure made available for the project by the appointing party.

**Table 37: Software infrastructure**

<i>Software</i>				
<i>Utilization</i>	<i>Model</i>	<i>Brand</i>	<i>Version</i>	<i>N° of Workstation</i>
<i>Sharing:</i>				
CDE				
...				
<i>Generic:</i>				
Writing				

<b>Software</b>				
<i>Utilization</i>	<i>Model</i>	<i>Brand</i>	<i>Version</i>	<i>N° of Workstation</i>
...				

NOTE: the information contained herein can be found in the OIL, AIL and/or PIL of the appointing party, where present.

### 11.3.1.3 Non-digital infrastructure

The following table shows the non-digital infrastructure made available for the project by the Appointing party.

**Table 38: Non digital infrastructure**

<i>Nr.</i>	<i>Typology</i>	<i>Location</i>	
	Office, Archive...	City	
		Road	
		ZIP CODE	
		Building	
		Floor	
		Timetable	
		Contact Person	
		Email	
		Phone	
...		...	

NOTE: the information contained herein can be found in the OIL, AIL and/or PIL of the appointing party, where present.

### 11.3.2 HW and SW infrastructure of the Contractor

The following paragraphs specify the Hardware (HW) and Software (SW) requested from the appointed party and deemed necessary for the specific project.

The appointed party will be required to provide the technical specifications of the Hardware and Software infrastructures that it uses to satisfy the information requirements set out in the EIR.

#### 11.3.2.1 Required Hardware Infrastructure

For the purposes of the information flows of this project and to support the activities described in this EIR, it is required that the appointed party makes available to the interested parties and to the appointing party an information infrastructure adequate to the correct functioning of the information flow.

☐ If no special Hardware (HW) infrastructure is required

Specifically, no specific hardware infrastructure is required for this project.

☐ If special Hardware (HW) infrastructures are required

Therefore, the following table shows the Hardware infrastructure specifically required for the project.

**Table 39: Required hardware infrastructure**

<i>Hardware</i>		
<i>Nr.</i>	<i>Typology</i>	<i>Prevailing features</i>
	Server	Language HD
	...	...
	Network	LAN speed Wi-Fi speed
	...	...
	NAS	...

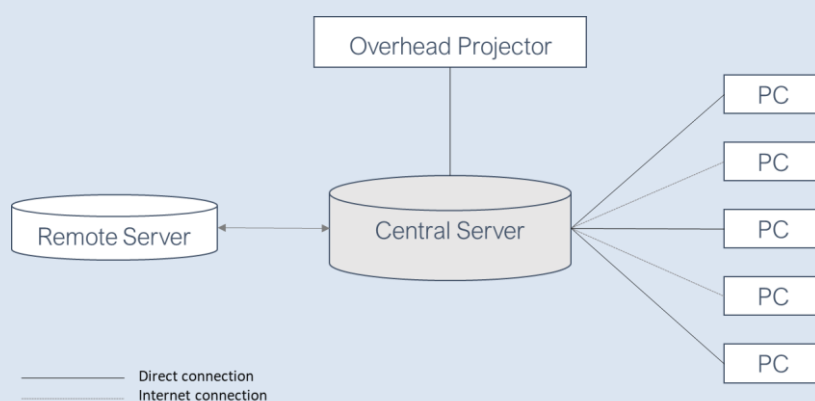
*NOTE: the information contained herein can be found in the OIL, AIL and/or PIL of the appointing party, where present.*

In the BIM execution plan, it is requested to explain the Hardware infrastructure to be used in the performance of the project and the activities described in this EIR.

The Hardware infrastructure already available and that one specifically intends to be used and / or integrated (purchase, rental, etc.) for this project must be indicated (specific integrations must be easily identifiable).

The above specification is equivalent to a declaration of availability and knowledge in the use (at an advanced professional level) of the infrastructure indicated, in the times and ways necessary for the use for this Contract.

The Hardware infrastructure and the related technical specifications must be summarized, by macro items, according to a graphic scheme and a tabular one to be described in the IDP and consequently as part of the BIM Execution plan, as indicated in the following examples:


**Figure 4 - Example of Hardware graphic scheme**

<i>Hardware</i>				
<i>Nr.</i>	<i>Typology</i>	<i>Prevailing features</i>	<i>Present</i>	<i>Guaranteed</i>
	Server	Language HD	x	

	...	...		X
	Network	LAN speed Wi-Fi speed	X	
	...	...		...
	NAS	...	...	

**Figure5 - Example of Hardware tabular schema**

*NOTE: the information contained in the above diagrams can be found in the OIL, AIL and / or PIL of the appointed party where present (and certainly present in the IDP of the same).*

In the case of several parties involved (e.g., temporary grouping of enterprises) the infrastructure used by each subject and their interaction must be explained.

In the case of suppliers and subcontractors, even during the project, the same schemes must be produced in the supply and subcontracting request and attached to the original BIM Execution Plan (BEP Pre contract).

#### 11.3.2.2 Required Software Infrastructure

For the purposes of the information flows of this project and to support the activities described in this EIR, it is required that the appointed party makes available to the interested parties and to the appointing party an information infrastructure adequate to the correct functioning of the information flow.

☐ If no special software infrastructures are required (SW)

Specifically, no specific software infrastructure is required for this project.

☐ If special software infrastructures are required (SW)

Therefore, the following table shows the Software infrastructure specifically requested for the order.

**Table 40: Required software infrastructure**

<b>Software</b>				
<i>Utilization</i>	<i>Model</i>	<i>Brand</i>	<i>Version</i>	<i>N° of Workstations.</i>
<i>BIM authoring:</i>				
Architecture				
...				
Facilities				
...				
Mechanical plants				
...				
Electrical plants				
...				

<i>Software</i>				
<i>Utilization</i>	<i>Model</i>	<i>Brand</i>	<i>Version</i>	<i>N° of Workstations.</i>
<i>Verification:</i>				
Clash detection.				
...				
Code Check.				
...				
<i>CAD:</i>				
Architecture				
...				
Facilities				
...				
Mechanical plants.				
...				
electrical plants.				
...				
<i>Calculation:</i>				
Schedules				
...				
Structural calculation.				
...				
Mechanical calculation.				
...				
electrical calculation.				
...				
<i>Generic:</i>				
Lighting				
...				
Energy efficiency				
...				
Programming				
...				
GIS				
...				
<i>Generic:</i>				
Writing				
...				

NOTE: the information contained herein can be found in the OIL, AIL and/or PIL of the appointing party where present.

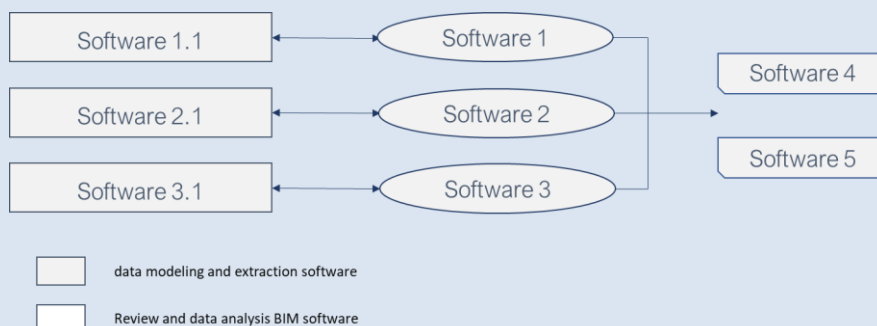


In the BIM Execution Plan it is requested to make explicit the Software infrastructure to be used in the execution of the project and the activities described in this EIR.

The software infrastructure already in use and the one that is specifically intended to be used and / or integrated (purchase, rental, etc.) for this project must be indicated (specific integrations must be easily identifiable).

The above specification is equivalent to a declaration of availability and knowledge in the use (at an advanced professional level) of the infrastructure indicated, in the times and ways necessary for the use for this project.

The Software infrastructure and the related technical specifications must be summarized, by macro items, according to a graphic scheme and a tabular one to be described in the IDP and consequently as part of the BIM Execution Plan, as indicated in the following examples:



**Figure 6 - Example of Software Chart Diagram**

Software						
Utilization	Model	Brand	Version	N° of workstations	Present	Guaranteed
<i>BIM authoring:</i>						
Architecture					X	
...						
Facilities						X
...						
Mechanical equipment					X	
...						
Electrical equipment						...
...						
<i>Verification:</i>						
Clash detection					X	
...						
Code Check.					X	
...						

Software						
Utilization	Model	Brand	Version	N° of workstations	Present	Guaranteed
CAD:						
Architecture					...	
...						
Facilities						...
...						
Mechanical equipment					...	
...						
Electrical plants					...	
...						
Calculation:						
Schedules						
...						
Structural calculation.						
...						
Mechanical calculation						
...						
Electrical calculation						
...						
Generic tec:						
Lightning						
...						
Energy efficiency						
...						
Programming						
...						
GIS						
...						
Generic:						
Writing						
...						

**Figure 7 - Example of Tabular Diagram Software**

NOTE: the information contained in the above diagrams can be found in the OIL, AIL and / or PIL of the appointed party where present and (certainly present in the IDP of the same).

In the case of several interested parties (e.g., temporary grouping of enterprises) the infrastructure used by each subject and their interaction must be explained.

In the case of suppliers and subcontractors, even during the project, the same schemes must be produced in the supply and subcontracting request and attached to the original BIM Execution Plan.

### 11.3.3 Information management skills

In the BIM Execution Plan, the non-binding listing of any previous direct experience, considered significant with respect to the ☐ Letter of Invitation ☐ to the Call ☐ Offer Request ☐ Other in question, in terms of the use of processes and methods of digital information management "BIM", is required.

Therefore, by way of example and not exhaustive, a standard table is reported to be considered in the explanation of their own previous information management skills.

<b>PREVIOUS INFORMATION EXPERIENCE:</b>		<b>n°</b>
<i>Name of the work/contract:</i>		
<i>Appointing party:</i>		
Category of intervention		
Type of intervention		
Localization of the intervention		
Amount of invitation to tender for assistance*	€	discount: ____%
Modelling and information management activities**		
of which carried out/assigned directly**		
Brief description of the activity		
Tender amount of the activity* information	€	discount: ____%
Statement by the Appointing party	Annex No.	X

(\*) The values are expressed gross of the discount subsequently applied (to be explained separately as a percentage)

(\*\*) Describe the modelling and information management activities applied to the contract and, in particular, their specific contribution

### 11.3.4 Data formats made available by the Appointing party

Each file made available by the Appointing party will be provided, where possible, in an open and interoperable format.

Any graphic models made available will be purely indicative and must in any case be verified according to the surveys on the places.

#### 11.3.4.1 Supply and exchange of data

For the purposes of data exchange and storage, the files must be provided to the appointing party in the open format and, where specified, in the open format required in the following paragraphs.

In case of disputes, it is the right of the appointing party to request the production of the original files in native format (even if proprietary).

☐ If CDE made available to the appointed party

In the case of CDE requested by the appointed party (see paragraph "Software Infrastructure required"), for the purpose of guaranteeing reading, management and storage of data over time, the appointed party (at the end of the project) must provide a specific report on the architecture, language, structure, etc. of the DB used on which the Sharing Environment is built.

#### 11.3.4.1.1 Tender phase

All digital documents and models made available by the appointing party will be delivered in open format (mainly in pdf, rtf, IFC, xml, etc.).

The digital copies of models and papers made available by the appointing party (announcement, attachments, etc.) will be visible and / or downloadable electronically at the following web address:

- [http/... enter web address...](#)

Any hard copies of the same model , where possible the extraction, will be available:

- for the acknowledgment, in the CDE of the appointing party (see paragraph "non-digital infrastructure");
- for the withdrawal, upon request and payment of live reproduction costs and fees, at: ... enter address... ; e-mail: ... enter mail... ; telephone: ... enter phone number... ; timetable: ... enter time for pick-up... .

On request, for the sole purpose of drafting the offers and without prejudice to the contractual prevalence of the open formats, the following models and digital drawings may be requested (and will be provided in digital copy) also in native format.

**Table 41: Models and drawings requested**

<i>Typology</i>	<i>Name</i>	<i>Format</i>
Model:	Survey by point cloud	
	MEP Systems	
	Facilities	
Drawing:	Point Cloud	
	Metric computation	
	Price analysis	
	...	

#### 11.3.4.1.2 Procurement phase

All digital drawings and models produced by the appointing party will be provided in open format (mainly pdf, rtf, IFC, xml) and made available to the appointed party in the Publication space (EN ISO 19650-1:2018) of the General CDE of the project.

However, this is without prejudice the contractual prevalence of the paper copy (or digital in open PDF format with Digital Signature) of the aforementioned drawings or of views of the models.

### 11.3.4.2 Required file formats

The open formats required by this Contract for digital models and drawings are as follows.

**Table 42: Open formats required**

<i>Typology</i>	<i>Required Format</i>	<i>Note</i>
Graphic Templates	IFC 2.3; IFC 4.0; LAND XML	
Graphic drawings	PDF, DXF	
Interference Analysis Reports	PDF	
Inconsistency Analysis Reports	PDF	
Calculation	PDF	
Text	PDF, RFT	
Programming papers	PDF, XML	
Presentation papers	PDF	
Point Cloud		
Images	TIF	
...	...	

The file formats requested by the appointing party must be confirmed and possibly implemented with additional open formats, according to a tabular scheme to be reported in the IDP and consequently as part of BIM Execution Plan, justifying the advantages for the project and the appointing party in the notes, as indicated in the following example.

**Table 43: Open format required and proposed**

<i>Typology</i>	<i>Format</i>		<i>Note</i>
	<i>Required (*)</i>	<i>Proposed (**)</i>	
Graphic Templates	IFC 2.3; IFC 4.0; LAND XML		
Graphic elaborations	PDF, DXF		
Interference Analysis Reports	PDF		
Inconsistency Analysis Reports	PDF		
Calculation	PDF		
Text	PDF, RFT		
Programming papers	PDF, XML		
Presentation papers	PDF		
Point Cloud			
Images	TIF		
...	...		

(\*) request of the Appointing party, minimum contract

(\*\*) proposal of the successful tenderer, additional to the (minimum) request of the Principal

### 11.3.4.3 File size

The individual models developed by the appointed party may have a maximum size of ... enter maximum size... Mb per single file.

Therefore, the appointed party will have to integrate the articulation of the structure of the models to respect the dimensional limits imposed here (decomposition of areas, buildings, etc.).

Specific information needs that may be limited by the size of the files imposed above must be explained according to a tabular scheme to be reported in the IDP and consequently as part of BIM Execution Plan justified in the notes and with the right of the Appointing party to accept or reject them according to the real necessity and solidity of the justifications themselves, as indicated in the following example:

Typology	Dimension		Note
	Required (*)	Proposed (**)	
Model			
...			

(\*) request of the appointing party, minimum contract

(\*\*) proposal of the appointed party, additional to the (minimum) request of the appointing party

### 11.3.4.4 Interoperability Information Specifications

In order to guarantee the completeness of data and attributes in the graphic models provided in open format and their interoperability with other models or drawings, the appointed party in the BIM Execution Plan, must specify in addition to the version of the .ifc format (as well as in the table in the paragraph "Required file formats"), also the Model View Definition (MVD) chosen and any additional sets of properties (IFC property set; IFC proxy) justifying the advantages for the specific intervention and for the Appointing party. In general, the MVD "Coordination View – CV 2.0" is preferred, guaranteeing, in addition, the inclusion of all the fundamental geometric parameters and the required information, as reported by way of example and not exhaustive in the following table.

**Table 44: Interoperability Information Specification**

Element type	IFC Class	Required property sets	LOIN
Example: Masonry	IfcWall	Project coding Object coding Price list coding WBS coding	All All All All
...	...	...	...

In addition, according to the specific software used for developing the information models, it is requested to specify any variations with respect to the association of native elements to IFC classes and with respect to the addition of additional information fields based on the tabular scheme proposed below.

All the information attributes requested by the Appointing party and / or declared Appointed party in the paragraphs:

- System of coding and naming of objects,

- LOIN,
- Defining how to resolve interference and inconsistencies

they must be present in the models filed in open format.

In the event of a request for the proprietary formats of the models, the Appointed party will verify the congruence of the information attributes present in the objects of the latter with the mandatory ones in open format.

### 11.3.5 Common coordinate system and reference specifications

Objects and graphic models must have a single common reference system.

For any other data, or information, for which its georeferencing is significant (regardless of the model or process that contains it) reference will be made to the common coordinates.

**Table 45: Reference systems**

<i>Absolute reference system</i>	
<i>Argument</i>	<i>Specification</i>
Intersection grids XX and YY	
Altitude	
Rotation from true north	
Ground floor PPF	
...	
<i>Other references of the Appointing party</i>	
<i>Argument</i>	<i>Specification</i>
Origin of the axis system	
Offsets and distances between axes	
Encoding axes or grids	
Units of measurement	
...	

In the BIM Execution Plan any other reference systems that are considered useful for the specific contract may be proposed by filling in the table below.

**Table 46: Other proposed references**

<i>Other proposed references (BIM Execution Plan)</i>	
<i>Argument</i>	<i>Specification</i>
...	...
...	...

### 11.3.6 Process step system

*Insert within the paragraph the system of phases of the process adopted.*

### 11.3.7 File encoding and naming system

☐ If NOT in possession of a coding

In the BIM Execution Plan, the single reference system for the classification and naming of the files delivered must be defined, together with the criteria that will be applied for the management of the system itself within this Contract.

By way of example, but not limited to, there are some classification and naming standards that can be used:

- BS 1192:2007+A2:2016;
- EN ISO 19650

In the case of proprietary or mixed systems, the BIM Execution Plan must be accompanied by a specific Annex containing the guide to the interpretation and use of the coding system used (structure, areas of application, limits of use, translation - if in another language, etc.; Annex "X": Structure of the proposed file classification system).

☐ If in possession of a coding

The name of the files will follow the coding as follows:

*... write the coding of the files. If necessary, prepare a Reference Annex or refer to the prepared paragraph of the Project Information Guidelines – PIL...*

The Appointed party, in case of need, may propose any additions to the structure described.

### 11.3.8 Object coding and naming system

☐ If NOT in possession of a coding

In the BIM Execution Plan, the single reference system for the classification and naming of digital objects, graphic models, together with the criteria that will be applied for the management of the system itself within this Contract, must be defined.

By way of example, but not limited to, there are some classification and naming standards that can be used:

- OMNICLASS (latest version available; ref.: <http://www.omniclass.org>);
- UNICLASS (latest version available; ref.: <https://toolkit.thenbs.com/articles/classification/>);
- UNIFORMAT (latest version available; ref.: <https://www.nist.gov>);

In the case of proprietary or mixed systems, the BIM execution Plan must be accompanied by a specific Annex containing the guide to the interpretation and use of the coding system used (structure, areas of application, limits of use, translation - if in another language, etc.;

For the purposes of completeness of information, a correlation document is required of the classification system of the digital objects of the graphic models with any other classification and naming system used for the elements contained in other models or elaborations of the Contract and, in any case, mandatory, with the classification and naming systems used to define the elements contained in:

- tables/abacuses;
- descriptive and performance specifications;
- price lists;
- metric calculations;
- WBS.



NOTE: The combination could be one to one, one to many, many to one, etc. indifferently. Each proposed reference system will have to consider the compliance with the systems already used for the previous phase.

Therefore, by way of example and not exhaustively, the following table shows the structure of correlation work of coding systems. The paper must be delivered in both open (PDF, XML) and native structured digital format.

<b>Object:</b>	<b>CODING</b>						
	<i>Model</i>	<i>Price list</i>	<i>WBS</i>	<i>CPV</i>	<i>Specifications</i>	<i>Descriptive specifications</i>	<i>International (e.g. Omniclass)</i>
Masonry ...	xx.xx.	xx.yy	yy.zz	Zz	kk.xxx.vv	000.vv	yy.00.ss
...	...	...	...	...	...	...	...

☐ If in possession of a coding

The coding and naming of the objects will follow the coding as follows:

*... write the coding of objects. If necessary, prepare a Reference Annex or refer to the prepared paragraph of the Project Information Guidelines– PIL (if in possession) ...*

The Appointed party, in case of need, may propose any additions to the structure described.

### 11.3.9 LOIN definition system

*Insert within the paragraph the system of definition of the LOIN adopted.*

## 11.4 Management Section

This section defines the minimum management requirements of reference in the implementation of the contract in terms of uses and objectives of models, information needs, coordination, identification of roles and liabilities, methods and timing of delivery.

The indications concern, to several topics, both the Appointing party and the Appointed party.

### 11.4.1 Informative objectives and uses

Without prejudice to any qualitative and quantitative constraints referring to the legal services due by the Appointed party for the contract in question, the models and the documents must also guarantee a quantity and quality of information sufficient to ensure:

- compliance with the objectives of the process phase to which they refer;
- compliance with the (specific) objectives envisaged and required in this EIR in the following paragraphs;
- the (specific) uses envisaged and requested in this EIR in the following paragraphs.

#### 11.4.1.1 Phase objectives

Insert here the phase(s) to which this EIR is referred.

<i>Initiative and Initiation</i>	
Requirements	
Two-year program of services and supplies	
Three-year work programme	
Economic Framework	
Design Policy Document	
<i>Design</i>	
Investigations and surveys	
Technical and Economic Feasibility Project	
Feasibility document of design alternatives	
Final Project	
Executive Project	
Design verification	
<i>Construction</i>	
Realization of the works	
Test	
<i>Building use</i>	
Management	
Maintenance	

Therefore, the objective of the phase of the contract in question is expressed in the following table:

Phase	Phase objective
-------	-----------------

...	...

NOTE: the information contained herein can be found in the OIL, AIL and / or PIL of the Appointing party where present or more generally in the EN ISO 19650-1: 2018.

In the BIM Execution Plan, any additional objectives useful for improving the transparency, congruence and information management of this Contract may be proposed, by filling in the table below.

Phase	Phase objective
...	...

#### 11.4.1.2 Objectives of models and drawings

Without prejudice to any legal constraints and requirements, in relation to the phases considered, the minimum reference models for the aforementioned phase and their objectives are defined as follows.

Phase	Model	Objective of the model

NOTE: the information contained herein can be found in the OIL, AIL and / or PIL of the Appointing party where present or more generally in the o EN ISO 19650:2018.

In the BIM Execution Plan, the proposed structuring of the models that will be produced for the following Contract must be explained and any further useful objectives may be proposed in a table such as the one shown below, in order to improve the transparency, congruence and information management of this Contract.

Phase	Model	Objective of the model

The graphic models can be divided, for example, according to the disciplinary areas and the various disciplines concerned (EN ISO 19650:2018). Type, quantity and quality of the models and their subdivision must be modulated according to the current legislation, the phases, objectives and uses of the models required herein.

An illustrative and non-exhaustive scheme of structuring and subdivision of graphic models is used both as "survey models" and as "project models" (EN ISO 19650:2018):

- GIS graphic models – survey and/or project
  - Territorial (environmental, geological, etc.);
  - Cadastral;
  - Topography;
  - Urban planning;

- Constraints;
- Other...
- BIM Authoring graphic models – relevant and/or project
  - Site/grounds;
  - Urban planning;
  - Constraints (historical, artistic, environmental, servitude, etc.);
  - Urbanization;
  - Architectural (building);
  - Finishes;
  - Facades;
  - Structures;
  - Mechanical plant engineering;
  - Water systems;
  - Electrical systems;
  - Security;
  - Fire prevention;
  - Energetic;
  - Acoustic;
  - Maintenance;
  - Disposal;
  - Other...

The subdivision can also be by zones, by location (network systems), by buildings, by levels (underground plate, above-ground development, etc.), and more.

#### 11.4.1.3 Uses of models and drawings

For illustrative and non-exhaustive purposes only, without prejudice to any constraint and legal prescription in relation to the phases considered, it is required that the models and the drawing can guarantee at least the minimum uses described below:

<i>Phase</i>	<i>Model</i>	<i>Using the Template</i>

<i>Phase</i>	<i>Drawing</i>	<i>Use of the paper</i>

*NOTE: the information contained herein can be found in the OIL, AIL and / or PIL of the Appointing party where present or more generally in the o EN ISO 19650: 2018.*

In the BIM Execution Plan, any further uses that are expected to be useful may be proposed, in a tale such as the one shown below, in order to improve the transparency, congruence and information management of this Contract.

<i>Phase</i>	<i>Model</i>	<i>Using the Template</i>
--------------	--------------	---------------------------

<i>Phase</i>	<i>Drawing</i>	<i>Use of the paper</i>

#### 11.4.2 Information content

The following paragraphs contain the supporting information provided for this Contract and the indications on the minimum information content to be delivered at the end of the activities planned and defined in the EIR.

##### 11.4.2.1 Information content provided by the Appointing party

They are ☐ listed below ☐ in Annex "... " ☐ Other files made available by the Proposed for this Contract.

##### 11.4.2.2 Minimum information content required

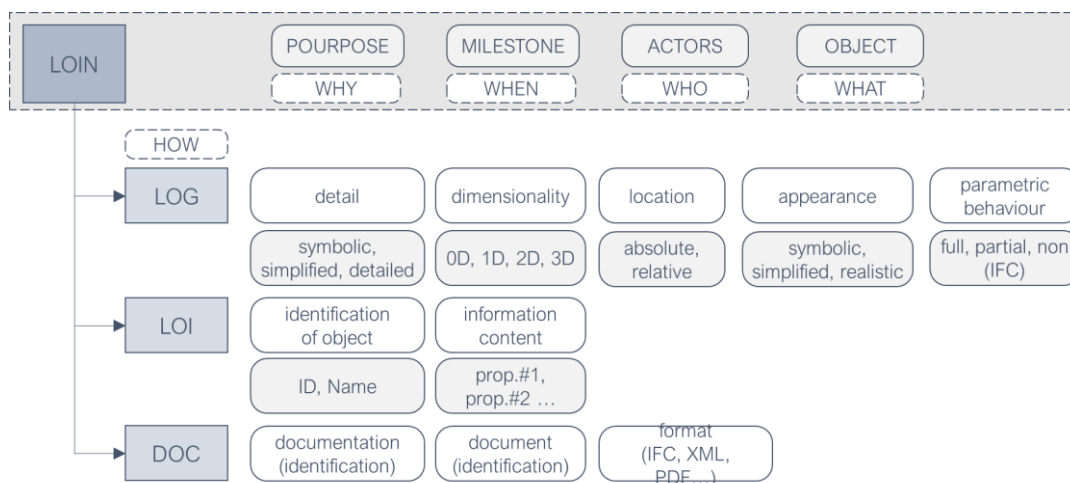
Without prejudice to any legislative reference due to the nature and type of work and intervention, the minimum production of the graphic drawings (two-dimensional) is required, directly extracted or linked to the models reproducible on paper or digitally (PDF) at a scale appropriate to the level of the process phase, as reported ☐ in the following list in Annex "... " ☐ Other ☐.

*NOTE: the information shown here can be found in the PIR of the Appointing party where present.*

In BIM Execution Plan, any additional objectives useful for improving the transparency, congruence and information management of this Contract may be proposed.

#### 11.4.3 LOIN

The level of information required - LOIN (EN ISO 19650) required from the Appointed party for the contract in question (Object), is defined in accordance with the requirements and subsequent amendments for the phases covered by the Contract (Purpose), according to the deposit times established in the ☐ Letter of Invitation ☐ in the Notice ☐ in the Request for Offer ☐ in the Request (Milestone of deliveries).



**Figure 8 - prEN17491 – EN ISO 19650 (a.pavan)**

The LOIN will also have to satisfy the accomplishment of the phase objectives and the objectives and uses of the models identified in the previous paragraphs. Furthermore, it must be specified (prEN 17412):

- The purpose for the use of the information to be delivered;
- Information delivery milestones;
- The actors who will request and provide the information;
- Objects in one or more decomposition structures;

as better defined in the following paragraphs.

#### 11.4.3.1 LOD

The Levels Of Development (LEVEL Of Development) – LOD chosen for each discipline and for each object of each graphic model are designed to guarantee the minimum legal constraints in force, as well as the phase objectives and the objectives and uses of the models described herein.

<i>Phase</i>	<i>Model</i>	<i>LOD Required</i>	<i>Note</i>

In the BIM Execution Plan different LODs must be confirmed or proposed, filling in the table below reported, justifying the advantages for the Contract and the Appointing party in the notes.

<i>Phase</i>	<i>Model</i>	<i>LOD</i>		<i>Note</i>
		<i>Required (*)</i>	<i>Proposed (**)</i>	

(\*) request of the Appointing party, minimum contractual

(\*\*) proposal of the Appointed party, additional to the (minimum) request of the Appointing party

It is also requested to define a summary synthesis matrix of the minimum (M) and prevailing (P) level of development of LOD, distinguished by phase and by model, as reported in the following example and not exhaustive general scheme.

	PHASES														
	INITIATIVE	INITIATION	CONCEPT DESIGN	PRELIMINARY DESIGN	DEVELOPED DESIGN	DETAILED DESIGN	BUILDING USE	END OF LIFE							
MODEL	M	P	M	P	M	P	M	P	M	P	M	P	M	P	M
RELIEF:															
ARTISTIC HISTORY:															
TERRITORIAL:															
URBAN:															
URBANIZATIONS:															
SITE:															
ARCHITECTURAL:															
FINISHES:															
CURTAIN:															
FACILITIES:															
ELECTRICAL:															
MECHANICAL SYSTEMS:															
HYDRO-SANITARY SYSTEM:															
AIR CONDITIONING SYSTEM:															
ANTIFIRE:															
ENERGETIC:															
ACOUSTIC:															
SAFETY:															
....															

By confirming the proposed LOD, the Appointed party assumes responsibility for the adequate compliance of the LODs with the legal constraints in force, in addition to the phase objectives and the objectives and uses of the models defined in these EIR.

The LOD responding to the legal constraints, the phase, the objectives and the defined uses, as well as the significance of the possible interferences or inconsistencies to be analyzed or verified (EN ISO 19650:2018) will determine:

- the degree of modelling needed;
- the degree of possible integration through drawing (2D drawings, texts, images, etc.);
- the quantity, quality and robustness (decision-making degree) of the necessary data and attributes.

These last indications will be specified in a dedicated annex (Annex "XX": Structure of the LODs). To ensure the correct reading and interpretation of the data, a special summary table must be prepared in support of the annex in which, for each information field included in the model and in the objects contained therein, the information necessary must be made explicit in order to eliminate possible ambiguities. Given the possible presence of predefined information fields within the specific modelling software used that are not removable and / or modifyable, it must be clearly specified which data provided are to be considered effective and which are not.

Therefore, by way of example and not exhaustive, the table below shows some indications:

<i>Class Information</i>	<i>Information field</i>	<i>Origin (ST/PR*)</i>	<i>Function</i>	<i>U.M. **</i>	<i>Good (YES/NO)</i>
<i>Model</i>	<i>Modeller</i>	<i>PR</i>	<i>Identify the responsible modeler</i>	-	YES
	<i>Project Status</i>	<i>ST</i>	<i>Identifies project status according to Contractor's internal specifications</i>	-	YES
	....	...	...	...	...
<i>Walls</i>	<i>Absorption</i>	<i>ST</i>	-	-	NO
	<i>Coding</i>	<i>PR</i>	<i>Identifies the identification code in compliance with the classification indicated in the BIM Execution Plan</i>	-	YES
	...	...	...	...	...
<i>Materials</i>	<i>Density</i>	<i>ST</i>	<i>Identify the density of the material</i>	<i>Kg/m</i>	YES
	<i>Description</i>	<i>ST</i>	<i>Identify the synthetic description of the material</i>	-	YES
	....	...	...	...	...
...	...	...	...	...	...

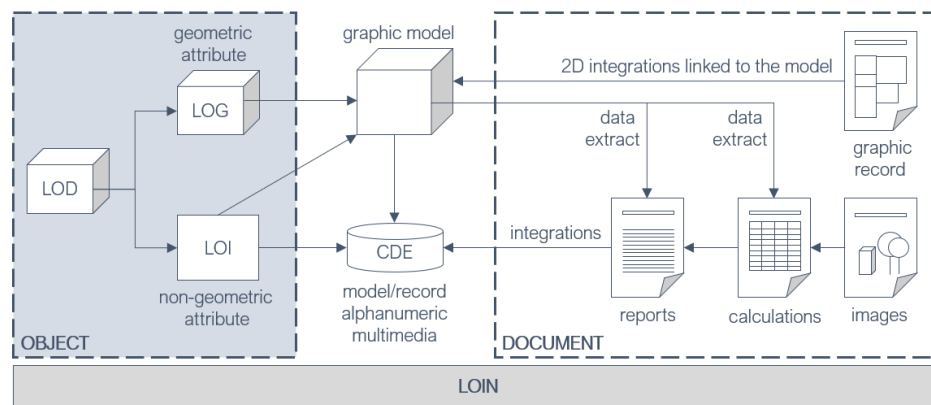
\* ST- standard: default parameter in modelling software; PR-owner: parameter inserted as user customization

\*\* U.M.: Units of measurement

The LODs defined must in any case guarantee the comprehensiveness and congruence of the information using graphic and non-graphic attributes connected / related to each other: object-model / drawing-CDE.

By way of example, see the following outline of principle:





**Figure 9 - Scheme of the LODs. Geometric and non-geometric information attributes (a.pavan)**

#### 11.4.3.2 LOG

The Level Of the Geometry - LOG must be taken from the LODs defined in the previous paragraph and currently in common use (EN ISO 19650:2018).

#### 11.4.3.3 LOI

The Level Of Information - LOI must be taken from the LODs defined in the previous paragraph and currently in common use (EN ISO 19650).

#### 11.4.3.4 DOC

The information level of the Documents – DOC to be produced by the Appointed party, for the phases covered by the contract and as the minimum level for this Contract.

### 11.4.4 Roles, responsibilities and authorities for information purposes

In order to ensure collaboration between the interested parties and the efficiency and effectiveness of the information flow of the Appointed party, the following paragraphs identify the positions, roles and authority for the purposes of information of the Appointing party.

In the BIM Execution Plan, the positions, roles and authority for the information purposes of the Appointed party must be specified in the same way.

#### 11.4.4.1 Organization chart of the Appointing party

The information structure of the Appointing party for this Contract, without prejudice to the reference functions referred to in EN ISO 19650 is structured as follows:

... Report here the organization chart, available in the Project Information Guidelines– PIL where present ...

The information flow of the Appointing party for this Contract, therefore, is structured as follows by the roles used:

... Report the flow established for the order, available in the Project Information Guidelines – PIL where present ...

In the BIM Execution Plan, in addition to the identification of the organization chart of the Appointed party, it must be specified how it is intended to integrate into the process the coordination and verification activities required in the paragraph "Information Coordination" and which will be the figures who will deal with it.

Example of organizational chart:

...

Example of information flow:

...

#### 11.4.4.2 Personal data of the subjects

Due to the information roles identified in the previous paragraph, the references of the relative figures of the Appointing party are reported.

... Report the personal data of the subjects available in the Project Information Guideline – PIL where present...

In the BIM Execution Plan, the references of the personnel involved in the information process of each organization involved must be explained, in line with the roles identified in the previous paragraph.

We report, therefore, an illustrative and non-exhaustive table on the personal data of the figures:

<b>Organization A</b>		...					
<b>Figure</b>		<b>Company role</b>	<b>Information role</b>	<b>Email</b>		<b>Tel.</b>	<b>Mob.</b>
<b>Name</b>	<b>Surname</b>			<b>corporate</b>	<b>Certified</b>		
			CDE manager				
			Information coordinator				

#### 11.4.4.3 Information Responsibilities Matrix

Due to the information roles identified in the previous paragraph, the matrix of the Information Responsibilities of the Appointing party is reported.

... Report matrix of information responsibilities available in the Project Information Guidelines – PIL where present...

In the BIM Execution Plan, the matrix of responsibilities for the contract in question must be defined, in line with what was declared in the previous paragraphs.

Example of matrix of responsibilities:

...

#### 11.4.5 Information references of the Appointing party (OIL)

The Organization information Guidelines - OIL will be made available to the bidder within the CDE, which defines the information references of the Appointing party. Specifically, upon request and with adequate justification, you can take a view of the following annexes:

A Organization Information Requirements (OIR)

A1. Organization Information Maps (OIM)

B. Asset Information Guidelines (AIL)

B1. Asset Information Requirements (AIR)

B2. Asset Information Models (AIM)

C. Project Information Guidelines (PIL)

C1. Project Information Requirements (PIR)

C2. Project Information Models (PIM)

E. Platform Data Management (PDM)

E1. Common Data Environment (CDE)

E2. Data Room (DR)

#### 11.4.6 Structure and organization of information content

The following paragraphs focus on the analysis and explanation of the structure and organization of information content. Therefore, starting from the structure of the disciplinary models that will be described in the BIM Execution Plan (see paragraph *Objectives of models and drawings*) the following must be specified.

##### 11.4.6.1 Information content tree

In the BIM Execution Plan, the tree structure of the information contents in reference to this Contract must be specified.

Example of an information content tree structure:

...

##### 11.4.6.2 Object tree

In the BIM Execution Plan, the tree structure of the objects in reference to this Contract must be specified.

Example of an object tree:

...

##### 11.4.6.3 Specifications for inserting objects

Regardless of the format with which they will be originated and deposited, all graphic models must be developed by applying modeling criteria that allow their easy reading, interrogation and subsequent re-elaboration.

In particular, in all cases where possible, the rules for a correct parameterization of the elements must be respected by introducing the appropriate geometric constraints. By way of example and not exhaustively, some reference rules are reported so that the following basic information can be readable and traceable to the object:

☐ Territorial

- All the points inserted inside the model must report the investigated stratigraphy;
- Other.

☐ Infrastructure (example)

- All objects inserted within the graphic model must be related with the class of belonging (according to the specific discipline);
- All horizontal elements shall be associated with the reference level at which they stand;
- All structural elements must be bound to the axes associated with them;
- All plant engineering machines must be related with the reference level of the discipline/environment underlying them;
- ...
- Other.

☐ Buildings (example)

- All objects inserted within the graphic model must be related with the class of belonging;
- All the finishing layers of the floors placed on the intrados and the false ceilings must be associated with the level / environment below them;
- All structural elements must be bound to the axes associated with them;
- All plant engineering machines positioned on the ceiling must be related with the reference level of the discipline / environment underlying them;
- All machines and plant engineering devices must be modeled with the exact position of the joints (where provided for by the LOIN) with respect to the real element.
- ...
- Other.

☐ Refer to the Project Information Model – PIM (if in possession)

In the BIM Execution plan any further specifications for the insertion of objects may be proposed, justifying the advantages for the Contract and the Appointing party.

#### 11.4.6.4 Extrapolation of drawings from models

In the BIM Execution Plan must be explained the documents directly extrapolated from the graphic models or directly connected to them. By way of example and not exhaustive, a reference table is reported:

<i>Model</i>	<i>Code</i>	<i>Drawing</i>	<i>Code</i>	
...				
<i>architectural</i>	<i>xx.xx</i>	<i>ground floor plan</i>	<i>xx.xx.xxx</i>	<i>e</i>

	<i>xx.xy</i>	<i>first floor plan</i>	<i>xx.xx.xxy</i>	<i>e</i>
	<i>...</i>	<i>...</i>	<i>...</i>	
	<i>zz.zz</i>	<i>metric calculation of architectural works</i>	<i>xx.xx.xxZ</i>	<i>e</i>
		<i>Estimation architectural works</i>	<i>xx.xx.xxk</i>	<i>c</i>
	<i>...</i>	<i>...</i>	<i>...</i>	
<i>...</i>				
<i>legend</i>				
	<i>e</i>	<i>drawing extrapolated from model</i>		
	<i>c</i>	<i>drawing related to the model</i>		

#### 11.4.7 Time scheduling of information content

In the BIM Execution plan the time schedule envisaged for modelling and the general information process (information schedule) must be explained in relation to the planning of the work phases (work schedule).

A tree structure of the information and modeling activities (Work Breakdown Structure: WBS) must be defined, which also includes the iterations with the Appointing party and any other legal entity interested in this Contract in the same phase of the process analyzed.

The activities, dependencies and temporalities must also be explained in graphic form through Gantt charts. The Critical Path Method (CPM) must be highlighted and all information must be updated at least weekly and published in the CDE.

For detailed planning, Agile programming systems and Kanban Boards are allowed, in addition not as a substitute.

In the planning of the information phases, however, the following milestones for the drafting/updating of the models must be envisaged:

##### ☐ Inititative/Initiation

- Survey of the state of fact;
- Delivery;
- Other.

##### ☐ Design

- Survey of the state of fact;
- Specialist calculations and reports;
- BIM Review (Clash and Code);
- Delivery;
- Other.

##### ☐ Construction

- Start of work, preparation of the construction site;
- Specialist calculations and reports;
- BIM Review (Clash and Code);

- SAL;
- End of works;
- Testing;
- Delivery;
- Other.

☐ Building use

- As-built model;
- Delivery;
- Other.

#### 11.4.8 Policies for the protection and security of information content

In the BIM Execution Plan, the security policies adopted for the protection of data and the guarantee of the rights connected to them (copyright, patent, etc.) must be explained.

In particular, the following must be explained:

- The pre-deposit rescue and backup systems and their timing;
- The specific IT and information insurance coverage;
- The levels and rights of access and modification provided for each information system adopted;
- The number of post-deposit copies retained and the storage and protection times adopted.

##### 11.4.8.1 Regulatory references for data security

The main regulatory references on the security of computer and information data are reported by referring to EN ISO 19650 and any other mandatory standard in question.

For information security management systems:

- ISO/IEC 27000:2016 Information technology - Security techniques – Information security management systems - Overview and vocabulary
- ISO/IEC 27001:2013 Information technology - Security techniques – Information security management systems – Requirements
- ISO/IEC 27002:2013 Information technology - Security techniques - Code of practice for information security controls
- ISO/IEC 27005:2011 Information technology - Security techniques – Information security risk management
- ISO/IEC 27007:2011 Information technology - Security techniques - Guidelines for information security management systems auditing
- ISO/IEC TR 27008:2011 Information technology - Security techniques – Guidelines for auditors on information security controls

For privacy:

- ISO/IEC 29100:2011 Information technology - Security techniques – Privacy framework

For techniques and technologies:

- ISO/IEC 9798-1:2010 Information technology - Security techniques – Entity authentication - Part 1: General
- ISO/IEC 18033:2015 Information technology - Security techniques – Encryption algorithms - Part 1: General
- ISO/IEC 27039:2015 Information technology - Security techniques - Selection, deployment and operations of intrusion detection and prevention systems (IDPS)
- ISO/IEC 27040:2015 Information technology - Security techniques – Storage security
- ISO/IEC 29115:2013 Information technology - Security techniques – Entity authentication assurance framework.

#### 11.4.8.2 Additional data security requests

*Please list additional data security requests. Otherwise, please refer to current legislation.*

*For example: "... Any sensitive data (national security, national military security, supranational military security - NATO, state secrecy, etc.) must refer to the specific rules on the subject to which reference is made in full ...".*

#### 11.4.9 Data Sharing Mode (Common Data Environment)

For the purpose of efficiency in the sharing of data, information and information content (models and documents) their status of definition and approval must always be recognizable according to EN ISO 19650:

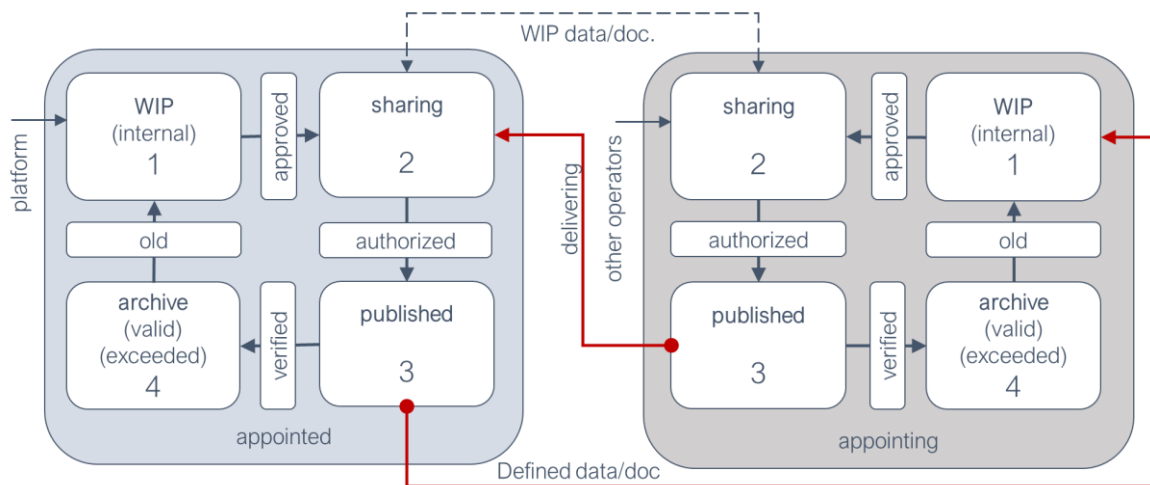
- Definition status:
  - being processed/updated;
  - in the process of sharing;
  - in the process of publication;
  - archived:
    - "valid", version still in force;
    - "exceeded", relating to versions prior to the one in force and therefore replaced.
- Approval status:
  - A0: to be approved;
  - A1: approved;
  - A2: approved with comment;
  - A3: Not approved

In the BIM Execution Plan the appointed party therefore specifies how it intends to satisfy this request.

##### 11.4.9.1 Features of sharing infrastructures

The CDE of the Appointing party and of the Appointed party must be divided into at least four sections useful for the distribution of data, information and information content of the Contract according to the state of definition referred to in the previous point.

The data exchange flow from the CDE of the Appointing party to the CDE of the Appointed party will have to follow the proposed scheme:



**Figure 10 - Construction CDE and information flow (a.pavan)**

Where:

1. **in progress** (internal): internal work environment and data acquisition not visible from subjects external to the organization;
2. **sharing**: data sharing environment processed but not completed or coordinated;
3. **published**: environment for sharing completed and coordinated data;
4. **archive** (valid, outdated): internal working environment.

☐ If NOT in possession of a CDE

In the BIM Execution Plan, the access rules must be defined, the rights of the accredited subjects to operate in the CDE of the Appointed party.

The CDE of the Appointed party must guarantee the security of the data contained therein by also providing functions for backup and disaster recovery

The same must guarantee the traceability of the operations carried out of which the Appointing party can make an explicit request in case of disputes.

☐ If in possession of a CDE

In detail, the characteristics of the data sharing infrastructure are better described in the Annex F1 CDE- Common Data Environment.

#### 11.4.9.2 Deposit system

The deposit of data, information and information content (models and / or drawings EN ISO 19650) relating to services, works or supplies subject to contract, for each phase of the planned process, takes place, in general, through:

- Digital support
  - of files in open format (PDF), Digitally Signed;
  - of files in open format, Electronically Signed by deposited in a structured data sharing environment with specific management rules, hereinafter CDE (EN ISO 19650);



- any files in proprietary format (not definable by the Appointing party, due to specific needs of transparency, congruence and data management), signed electronically through deposit in the CDE (above);
- Paper support
  - of documents drawn up not digitally (EN ISO 19650), with Handwritten Signature;
  - of reproductions (by print, plotting, etc.), with Handwritten Signature, of digitally drawn up works and extrapolations/views, etc. of models "graphic", "documentary", "multimedia" models

For the filing of tender and procurement documents of this specific ☐Supply ☐ Service ☐ Work see the provisions of the "... report details of the reference document...".

The contractual prevalence of data, information and information content always remains:

- in the works on digital support in open format (PDF), Digitally Signed;
- in paper documents with Handwritten Signature.

It is a duty of the Appointed party to declare the consistency of the information content deposited on paper with a Handwritten Signature or on digital support, in open format (PDF), with Digital Signature, according to the proprietary models and digital documents from which they originated.

For any other information concerning the storage of data on the data sharing platform – CDE, please refer to the Annex F1: CDE – Common Data Environment.

#### **11.4.9.3 File Management**

*Provide reference directions for file management.*

#### **11.4.9.4 Data management**

*Provide reference information for data management.*

### **11.4.10 Supply Chain Information Content Management**

In the BIM Execution Plan, the method of programming and managing the information content of any sub-contractors must be explained.

The Appointing party considers as communicated and acquired the information rules of this EIR in question, as well as those of the BIM Execution Plan of the Contractor, for each sub-contractor interested in the Contract.

The Appointed party is in any case responsible for the completeness and congruence of data, information, elaborations and models produced by each of its sub-contractors. In addition to the management of its CDE towards the same sub-contractors.

#### **11.4.11 Verification procedures, validation of information content**

All models, drawings and objects produced for this Contract will be subject to verification and consequent validation by the Contractor in compliance with current regulations.

#### **11.4.11.1      *Definition of validation procedures***

In the BIM Execution Plan, the procedures for the informative validation of their data, information, models, documents and objects that the Appointed party intends to carry out in the performance of the Contract must be explained.

In particular, the following must be defined:

- The procedures;
- The timing;
- Responsibilities;
- The object of validation.

#### **11.4.11.2      *Definition of the articulation of the verification operations***

In the BIM Execution Plan, the articulation of the verification operations that are intended to be applied and guaranteed, defined according to the EN ISO 19650, must be explained.

### **11.4.12          *Information coordination***

The following paragraphs analyse the methods of coordination of the data produced for this Contract.

Therefore, in the BIM Execution Plan, the methods of coordination of the models, the methods of searching for interferences and inconsistencies and their resolution must be explained and analyzed.

#### **11.4.12.1      *Coordination of models***

In the BIM Execution Plan, the methodology and temporality of coordination of the graphic models and the related extrapolated or connected drawings must be explained.

The coordination must involve, even to different degrees, each model created for this Contract.

Therefore, coordination is required according to EN ISO 19650.

The coordination must be reported through special reports that explain its completion and the result achieved.

#### **11.4.12.2      *Information interference (clash detection)***

In the BIM Execution Plan, the procedures for analyzing information interference for models, documents and objects must be explained.

It is required that, when possible or significant for the economy of the intervention, not only interference with the objects themselves is considered, but also with respect to the relative areas of assembly, maneuvering and maintenance.

For the purpose of managing coordination for interference analysis, a matrix such as the one proposed below may be used:

OBJECT OF THE COORDINATION	Coordination level	Facilities	Electric	...	...	Safety	Other Models
Object/Object							
Model(s)							
Model/Papers							
...							
...							
...							
Object/Object							
Model(s)							
Model/Papers							

NOTE: Empty cells can be used to indicate, by way of example and not exhaustively: which coordination will be ensured, the timing of coordination, the execution – or not – of a coordination, the outcome of the same (favorable, negative, partial, etc.).

The coordination analyses for interference are obviously free and called each time the Appointing party deems it necessary, but some timed and scheduled coordination milestones will still have to be defined.

At the end of each milestone analysis, a report of the interferences found for the subsequent resolution phases must be produced.

#### 11.4.12.3 Information inconsistencies (code checking)

In the BIM Execution Plan, the procedures for analyzing information inconsistencies for models, documents and objects must be explained.

For the purpose of managing coordination for the analysis of inconsistencies, a matrix such as the one proposed below can be used:

MODEL	OBJECT OF THE COORDINATION	Level of coordination	European legislation	National legislation	Regional legislation	Other legislation and standards	Energy saving	Acoustics	Contractual obligations	Design constraints	Constraints butnourishing	Other constraints
Facilities	Object	LC1										
	Model	LC2										

	<i>Processed</i>	LC3											
<i>Other models</i>	<i>Object</i>	LC1											
	<i>Model</i>	LC2											
	<i>Processed</i>	LC3											

NOTE: Empty cells can be used to indicate, by way of example and not exhaustive: which coordination will be ensured, the timing of coordination, the execution – or not – of a coordination, the outcome of the same: favorable, negative, partial, etc.

The coordination analyses of inconsistencies are obviously free and called whenever the Appointing party deems it necessary, but some timed and scheduled coordination milestones will still have to be defined.

At the end of each milestone analysis, a report of the inconsistencies found for the subsequent resolution phases must be produced.

#### 11.4.12.4 **Defining how to resolve interference and inconsistencies**

In the BIM Execution Plan, the methods for resolving interferences and information inconsistencies that may be found in the coordination processes must be explained.

In particular, at least the following must be defined:

- The procedures for calling coordination meetings;
- The legal entity responsible for the coordination meetings (and any modalities of replacement or rotation);
- The methods of defining possible rules of prevalence between models or drawings;
- The methods of resolution of the critical issues that have emerged and the responsibilities of resolution;
- The mode of interest of the Appointing party.

#### 11.4.13 **How to manage 4D, 5D, 6D and 7D information**

In the BIM Execution Plan, the methods of use of the models for the purpose of managing the planning of activities (4D), production costs (5D), management and maintenance of the work (6D), sustainability in production and operation (7D) must be explained.

All information attributes that may be necessary to satisfy the methods of use specified herein must comply with the requests made in this EIR with reference to the chosen LOIN.

#### 11.4.13.1 **Programming management (4D – Gantt, WBS, etc.)**

In the BIM Execution Plan, the methods of use of the models for the management of the planning of activities (4D) must be explained. By way of example and not exhaustively, it may be specified:

- The link between graphic model objects and WBS activities;
- The definition of the start/end times between the information attributes of the objects;
- Other...

#### **11.4.13.2      *Economic management (5D – calculations, estimations, etc.)***

In the BIM Execution Plan, the methods of use of the models for the purpose of cost management (5D) must be explained.

By way of example and not exhaustively, it may be specified:

- The link between chart model objects and price list items;
- The definition of products among the information attributes of objects;
- Other...

#### **11.4.13.3      *Management of the work (6D – management, maintenance and disposal)***

In the BIM Execution Plan, the first indications on how to use the models for the purposes of management during the exercise phase (6D) must be explained.

By way of example and not exhaustively, it may be specified:

- The link between graphic model objects and maintenance activities;
- The definition of the useful life cycles of products among the information attributes of objects;
- The definition of maintenance cycles among the information attributes of objects;
- Other...

#### **11.4.13.4      *Management of externalities (7D – Environmental sustainability, etc.)***

In the BIM Execution Plan, the methods of use of the models for the purposes of sustainability management (7D) must be explained.

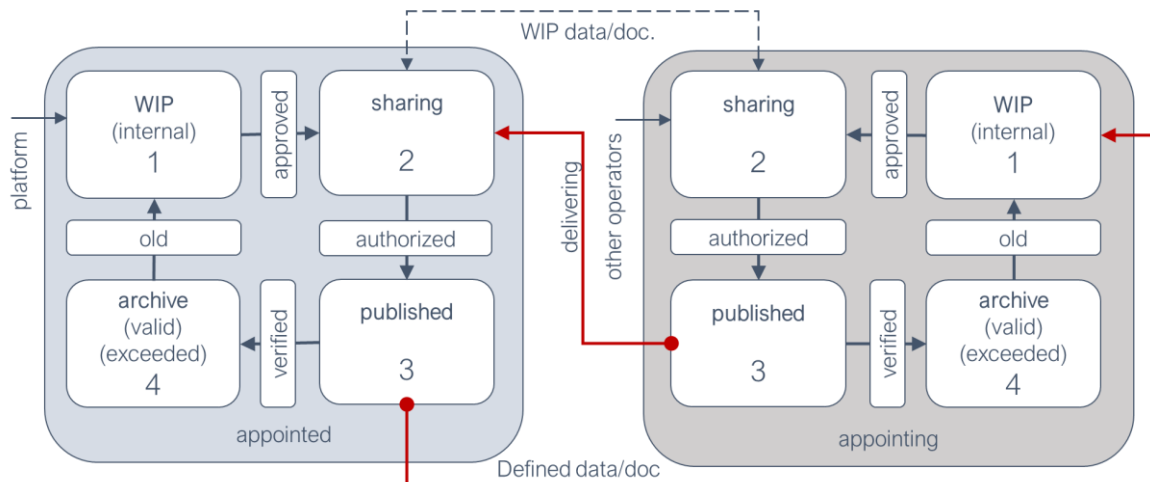
By way of example and not exhaustively, it may be specified:

- Energy Efficiency;
- Acoustic Analysis;
- Other...

#### **11.4.14          *How to deposit***

☐ If CDE of the Appointing party

Once the Contract has been completed, each model or elaboration contained in the CDE of the Appointing party will be transferred from the "in publication" section to the "archive" section.



**Figure 11 - Construction of CDE and information flow (a.pavan)**

Each model or process is considered deposited, in a digital sense, at the time of uploading in its open format in the "shared" section of the CDE of the order. At the time of loading, the protocol will be recorded with date, time and person responsible for the upload itself.

The validity and usability towards third parties also takes place from the publication (transfer in the "in publication" section).

At the time of uploading, the files that need a Digital Signature will be indicated.

☐ If CDE of the Appointed party

...

The digital filing does not conclude the terms of the filing of each hard copy required in the contract, nor of the delivery of the models in their native (even if proprietary) format.

The contractual relationship will be considered concluded following the delivery of the documents in the following manner and order:

- Deposit of a hard copy with Handwritten Signature;
- Digital deposit with Digital Signature;
- Deposit models (in their native format, although proprietary).

#### 11.4.15 Template properties

The models and all the objects contained therein and the elaborations, data and information relating to this Contract, also connected to the reading and use of the models as specified in this EIR, will be considered the property of the Appointing party who may manage this property at will without any duty to the Appointed party. Copyright is carried out according to current legislation.

## 12 Platform Data Management (PDM)

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### 12.1 Introduction

This document represents Annex E – to the OIL - Organization Information Guidelines. The Platform Data Management (PDM) is also completed through the Common Data Environment (CDE) and the Data Room (DR), which are also annexes of the OIL ( E1 and E2).

#### 12.1.1 Regulatory references

##### 12.1.1.1 Standards

Reference is made to the following Standards:

- EN ISO 19650-1:2018 - *Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 1: Concepts and principles*
- EN ISO 19650-2:2018 - *Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 2: Delivery phase of the assets*
- EN ISO 19650-3:2020 - *Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 3: Operational phase of the assets*
- EN ISO 19650-5:2020 - *Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 5: Security-minded approach to information management*

### 12.1.2 Acronyms and glossary

Here is a legend of the acronyms used and a synthetic glossary of the relative terms related to BIM and the digitalization of the construction sector:

ACRONYMS	DEFINITION TERMS	
	Digital Collaborative Platform	Digital environment for the organized collection and sharing of data, information, models, objects and documents related to the construction supply chain: resulting products, component products and processes (objects, subjects, actions). (EN ISO 19650)
CDE	Common Data Environment	Information source agreed for a given order or real estate asset, to collect, to manage and to forward each information container for the entire duration of the management of a contract. (EN ISO 19650-1)
DB	Database	Collector of information through which it is possible to make it available to any user.
	Datum	Intangible, elementary cognitive element, interpretable within a communication process through previously shared rules and syntax. (EN ISO 19650)

For any other term of an informative nature, reference is made to the mandatory legislation in question and, below, to the voluntary standards (CEN standards and ISO standards, if not in contrast).

## 12.2 Purpose

The purpose of this document is to identify the data management methods in the Organization; investigating flows, IT structure and dedicated instrumentation to better understand the administration and use of the same.

## 12.3 Information flows

### 12.3.1 Information flows within the platform

*Describe the information flows of the platform used by Organization for data management.*

### 12.3.2 Approval information flows

*Describe the approval information flows of the platform used by Organization for data management.*

### 12.3.3 Input and output information flows

*Describe the input and exit information flows of the platform used by Organization for data management.*



#### **12.3.4 Storage and protocol functions**

*Describe the storage and protocol functions of the platform used by Organization for data management.*

#### **12.3.5 File metadata**

*Define the metadata of the files inserted in the platform used by Organization for data management.*

#### **12.3.6 Coordination functions DB - CDE**

*Describe the coordination functions between the Data Base (DB) and the Common Data Environment (CDE).*

### **12.4 platform IT structure**

#### **12.4.1 Architecture**

*Describe the information architecture of the platform used by Organization for data management.*

#### **12.4.2 Protocols of dialogue**

*Describe the dialogue protocol of the platform used by Organization for data management.*

### **12.5 Dedicated tools**

#### **12.5.1 Platform hardware tools**

*Describe the hardware tools of the platform used by Organization for data management.*

#### **12.5.2 Platform software tools**

*Describe the software tools of the platform used by Organization for data management.*

## 13 Common Data Environment (CDE)

---

### 13.1 Introduction

This document represents Annex E1 to the OIL Organization Information Guidelines regarding data management within the Organization.

The Common Data Environment (CDE) is also completed through the Platform Data Management (PDM) and the Data Room (DR), which are also annexes of the OIL (E and E2).

Please note that the general information flow is shown in Fig. 1 of the Organization Information Guideline – OIL.

#### 13.1.1 Regulatory references

##### 13.1.1.1 Standards

Reference is made to the following Standards:

- EN ISO 19650-1:2018 - *Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 1: Concepts and principles*
- EN ISO 19650-2:2018 - *Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 2: Delivery phase of the assets*
- EN ISO 19650-3:2020 - *Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 3: Operational phase of the assets*
- EN ISO 19650-5:2020 - *Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 5: Security-minded approach to information management*

### 13.1.2 Acronyms and glossary

Find below the list of acronyms used and a synthetic glossary of the relative terms related to BIM and the digitization of the construction sector in the design of the interventions:

ACRONYMS	DEFINITION TERMS	
	Digital Collaborative Platform	Digital environment for the organized collection and sharing of data, information, models, objects and documents related to the construction supply chain: resulting products, component products and processes (objects, subjects, actions. (EN ISO 19650)
CDE	Data sharing environment	Information source agreed for a given order or real estate asset, to collect, to manage and to forward each information container for the entire duration of the management of a contract. (EN ISO 19650-1)
DB	Database	Collector of information through which it is possible to make it available to any user.
	Datum	Intangible, elementary cognitive element, interpretable within a communication process through previously shared rules and syntax. (EN ISO 19650)
	Metadata	Kit of information to computer documents, useful for their description and administration.

For any other term of an informative nature, reference is made to the mandatory legislation in question and, below, to the voluntary standards (CEN standards and ISO standards, if not in contrast).

## 13.2 Purpose

The purpose of this document is to identify the data management methods in the Organization; investigating flows, IT structure and dedicated instrumentation in order to better understand the administration and use of the same.

## 13.3 Information flow

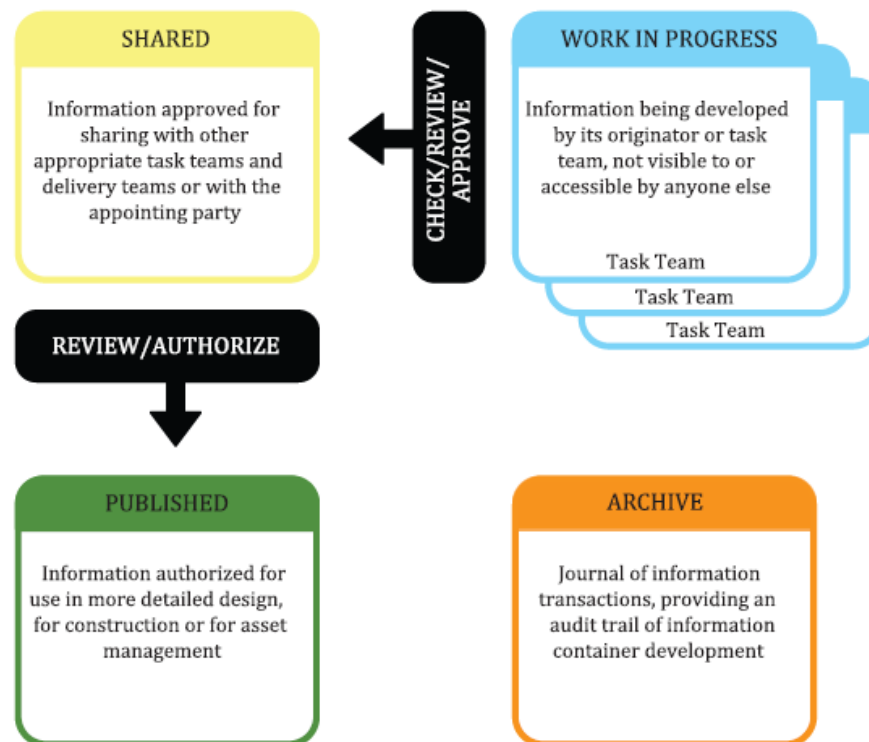
### 13.3.1 Information flows within the CDE

Indicate the product/platform used by the Organization as Common Data Environment (CDE) and describe the information flow within the CDE.

Each project created within it provides a configuration in line with the indications provided by EN ISO 19650. Therefore, users, with regulated and different permissions, will have the following folders available:

- IN PROGRESS, containing information under development and visible only to the individual;
- SHARING information approved by the Distributor for sharing with the Appointing party;
- PUBLISHED, information authorized by the Appointing party for use in the most detailed design;

- ARCHIVE, history of all information containers that have been shared and published during the information management process as well as a protocol to verify their development.



**Figure 12 - Common Data Environment Concept - EN ISO 19650-1:2018**

The documentation, therefore, passes through the folders according to its "state". Regarding the flow of operations initiated by the user, please refer to the platform-specific manual.

### 13.3.1.1 Deposit information flows

For the deposit of files on the platform, the Appointed party is invited to follow the instructions punctually described in the "upload documentation" step of the Approval Workflow. Every activity carried out by users is then visible within the "Events" section.

### 13.3.1.2 Approval information flows

Within the platform, an information flow of approval of the documentation has been configured, which is structured as follows (Describe):

### 13.3.2 Input and output information flows

*In this paragraph, the input and exit information flows are described as, for example, reported below:*

It is possible to identify two levels of input and output flows:

- Input and output flows external to the CDE;
- Input and output flows inside the CDE.

### **13.3.2.1 Storage and protocol functions**

*Describe*

### **13.3.3 File metadata**

*Describe*

## 14 Data Room (DR)

---

### 14.1 Introduction

This document represents Annex E2 to the OIL - Organization Information Guidelines. The Data Room (DR) is also completed through the Platform Data Management (PDM) and the Common Data Environment (CDE), which are also annexes of the OIL (E and E1).

#### 14.1.1 1.1 Regulatory references

##### 14.1.1.1 Standards

Reference is made to the following Standards:

- EN ISO 19650-1:2018 - *Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 1: Concepts and principles*
- EN ISO 19650-2:2018 - *Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 2: Delivery phase of the assets*
- EN ISO 19650-3:2020 - *Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 3: Operational phase of the assets*
- EN ISO 19650-5:2020 - *Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 5: Security-minded approach to information management*

### 14.1.2 Acronyms and glossary

Find below the list of acronyms used and a synthetic glossary of the relative terms related to BIM and the digitization of the construction sector in the design of the interventions:

ACRONYMS	DEFINITION TERMS	
	Digital Collaborative Platform	Digital environment for the organized collection and sharing of data, information, models, objects and documents related to the construction supply chain: resulting products, component products and processes (objects, subjects, actions. (EN ISO 19650)
CDE	Data sharing environment	Information source agreed for a given order or real estate asset (3.2.8), to collect, to manage and to forward each information container for the entire duration of the management of a contract. (EN ISO 19650-1)
DB	Database	Collector of information through which it is possible to make it available to any user.
	Datum	Intangible, elementary cognitive element, interpretable within a communication process through previously shared rules and syntax. (EN ISO 19650)

For any other term of an informative nature, reference is made to the mandatory legislation in question and, below, to the voluntary technical standard (CEN standards and ISO standards, if not in contrast).

## 14.2 Purpose

The purpose of this document is to identify the data management methods in the Organization; investigating flows, IT structure and dedicated instrumentation in order to better understand the administration and use of the same.

## 14.3 Document archive

### 14.3.1 Deposit system

*Describe the document filing system provided by the Organization (e.g. how and where the designer delivers the paper documentation).*

### 14.3.2 Storage system

*Describe the document archiving system provided by the Organization.*

### 14.3.3 Archive logistics

*Describe the archive logistics provided by the Organization.*

### 14.3.4 Document security

*Describe the documentary security required by the Organization.*

## 15 Case Study: Risanamento SpA

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### 15.1 Organization Information Guidelines – OIL



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DIPARTIMENTO DI ARCHITETTURA,  
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# Organization Information Guidelines - OIL

Organization Information Management Manual



RISANAMENTO SpA



### 15.1.1 Introduction

This Organization Information Guidelines (OIL) defines the procedures for producing, storing, managing, and transmitting your organization's information digitally.

Where present, the OIL joins the Quality Manual (ISO 9000) and draws from it indications and references. IoM integrates the Quality Manual for information aspects in a digital sense.

The following shall form an integral part of the OIL and shall be annexed to it:

A Organization Information Requirements(OIR)

A1. Organization Information Maps(OIM)

B. Asset Information Guidelines (AIL)

B1. Asset Information Requirements (AIR)

B2. Asset Information Models (AIM)

C. Project Information Guidelines (PIL)

C1. Project Information Requirements (PIR)

C2. Project Information Models (PIM)

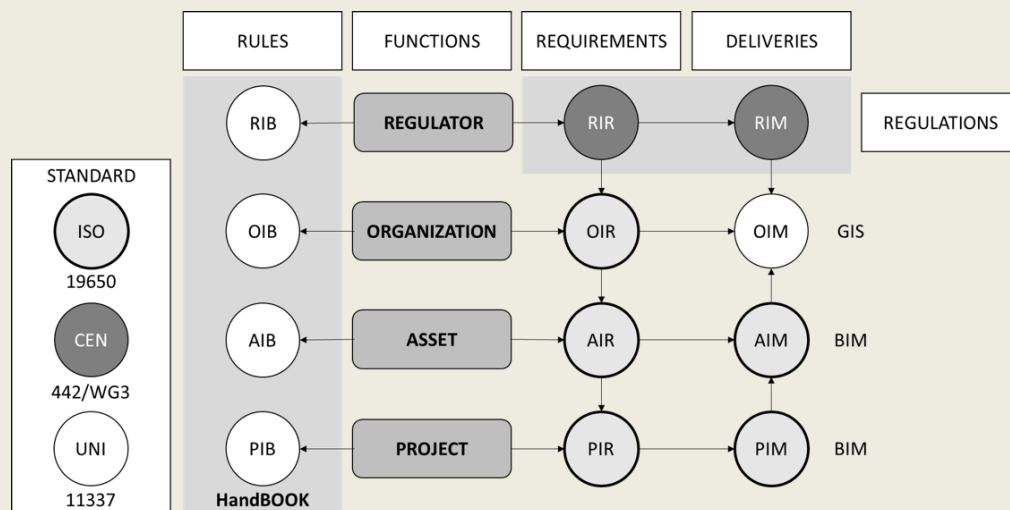
D. Exchange Information Requirements (EIR)

E. Platform Data Management (PDM)

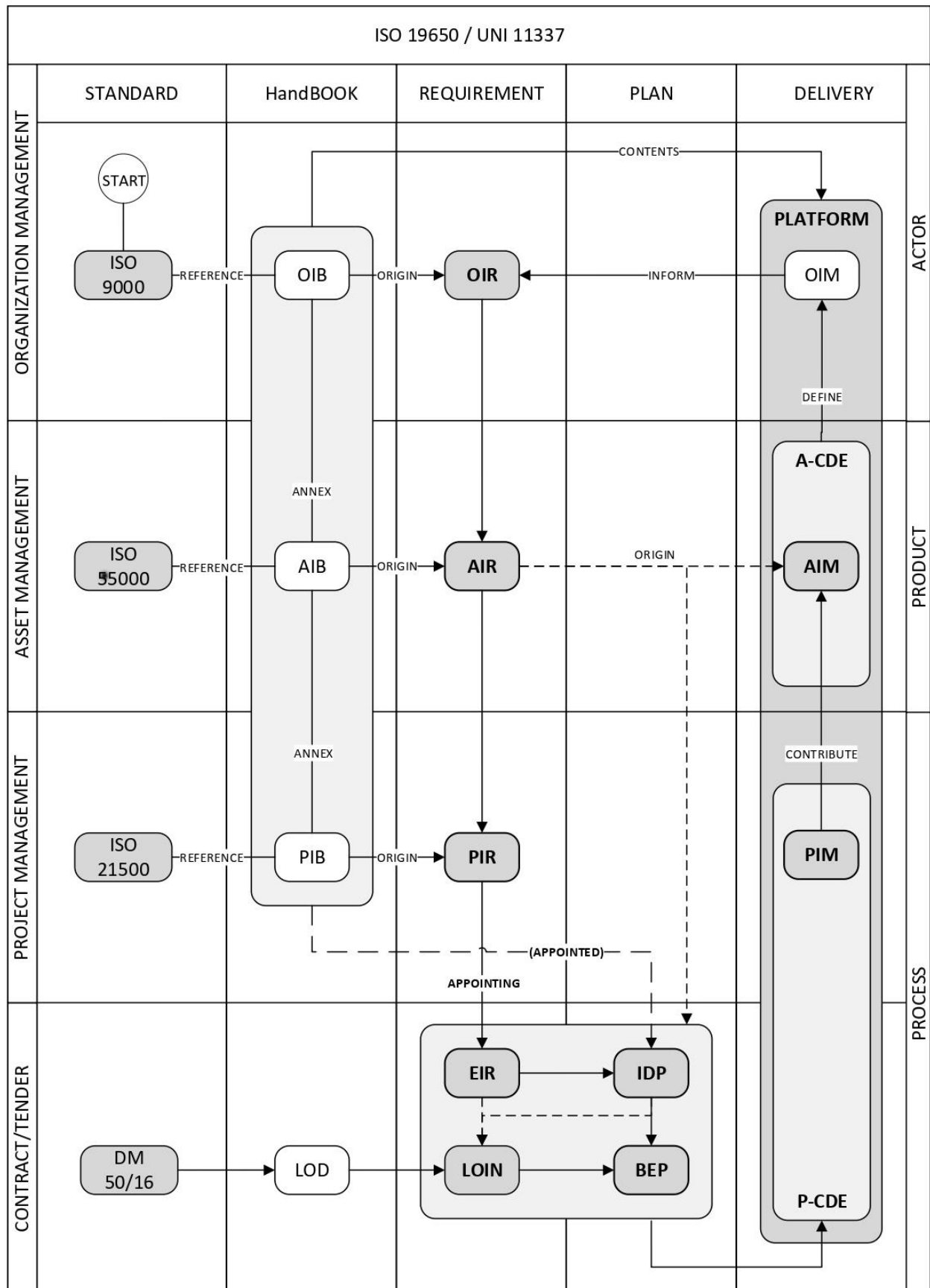
E1. Common Data Environment (CDE)

E2. Data Room DR

The information flows are defined as follows (fig. 1):



Implementation of the information flow and UNI 11337



## Connection diagram of the manuals from ISO 19650/UNI 1337

### 15.1.2 Regulatory references

#### 15.1.2.1 Rules

There are no specific reference standards.

#### 15.1.2.2 Standard

Reference is made to the following Standards:

- UNI EN ISO 19650-1:2018 - *Organization and digitization of information related to construction and civil engineering works, including Building Information Modelling (BIM) - Information management through Building Information Modelling - Part 1: Concepts and principles*
- UNI EN ISO 19650-2:2018 - *Organization and digitization of information relating to construction and civil engineering works, including Building Information Modelling (BIM) - Information management through Building Information Modelling - Part 2: Phase of delivery of real estate assets*
- UNI EN ISO 9000:2015 - *Quality management systems - Fundamentals and vocabulary*
- UNI EN ISO 9001:2015 - *Quality management systems – Requirements*
- UNI EN ISO 9004:2018 - *Quality management - Quality of an organization - Guidelines for achieving lasting success*

### 15.1.3 Acronyms and glossary

ACRONYMS	DEFINITION TERMS	
BIM	Building Information Modeling	Digitalization system of the building process for the optimization and efficiency of the planning, construction and management of buildings through the use of Information Technology systems.
	Datum	Intangible, elementary cognitive element, interpretable within a communication process through previously shared rules and syntax. (UNI 11337-1:2017)
	Information model (Model)	Virtualization information vehicle for objects of a work or a complex of works "in progress" or a modification of a complex of works already in place. (UNI 11337-1:2017)
	Integrated Design	Multidisciplinary building process aimed at optimizing the building process.
	Client: general definition	Any natural or legal entity that commissions, in any form of contract, a job, a service or a supply. (UNI 11337-5:2017)
Subjects involved – organisation/foreign relations (see section 4.1.1):		
	Commissioning	Contractor with characteristics of market operator who requires a provision of work or service to the organization.

		NB: Structured Public Contracting Station, real estate development company etc.
	Collaborations	Executor with a non-continuous collaboration with the organization for certain interventions NB: Engineering and / or architecture firms, professionals in specific fields (survey, vvf, asl, etc.), installers, specialized companies etc .
	Supply	Subject "supplier" of the organization of products for the performance of its activities. NB: manufacturers of components such as systems, finishes, etc.
	Clientele	Non-market operator requesting work activities or service to the organization. NB: private subject not market operator, general consumer.

For any other term of an informative nature, reference is made to the mandatory legislation in question and, below, to the voluntary technical standard (in the name of UNI 11337, CEN standards, ISO standards, if not in contrast).

#### 15.1.4 Purpose

The Organization Information Guidelines- OIL aims to define the general information rules of the organization, to promote communication, transparency, use and storage over time of the data generated by it or towards it.

#### 15.1.5 Activities

##### 15.1.5.1 Information benchmark

Risanamento SpA is a property company listed on the Italian Stock Exchange, which has been operating for several years in the Italian real estate sector with development and trading activities. Therefore, the organization is part of a national market with particular attention to the Lombard and Venetian territory.

The following table shows any barriers and opportunities deriving from the digitization of the organization in question:

EXISTING INFORMATION BARRIERS	EXPECTED INFORMATION OPPORTUNITIES
Part of the untrained staff	Staff with higher than average professionalism Recall for high-profile professionalism
Inadequate instrumentation	Effective instrumentation
Supply chain not sufficiently developed in BIM environment	
Other...	Other...

The current focus of the Company is represented by the redevelopment and development activities (Milano Santa Giulia; Complesso Immobiliare Grosio), as well as the management of a real estate portfolio (Torre di Quartesolo).

Therefore, the prominent references to which Risanamento Spa is inspired are:

- Land Lease;
- “Polis Fondi Sgr2;
- Other...

Using reference models of this type certainly brings benefits to the entire organization that can be summarized through the SWOT analysis shown in the following table:

INTERNAL FACTORS	STRENGTHS (S)	WEAKNESSES (W)
	Improved efficiency Alignment with Legislative Decree 50/2016 Other...	High economic investment Other...
FACTORS	OPPORTUNITY (O)	THREATS (T)
	Effective and linear communications Other...	Market not adequately prepared Other...

#### 15.1.5.2 Products and services

Risanamento SpA through its subsidiaries offers the service of:

- Development and redevelopment of areas,
- Purchase, sale, management and exchange of land and buildings,
- Possible construction, maintenance and administration of land and buildings,
- Other....

To do this it produces:

- Data collection;
- Design;
- Design patterns;
- Coordination and verification models;
- As-built models;
- Asset models;
- Management and maintenance models;
- Other...

The following table shows the distribution of the information services managed by Risanamento SpA:

PHASE	INTERNAL INFORMATION SERVICES	CONSULTING	EXTERNAL INFORMATION SERVICES
REQUIREMENTS FRAMEWORK	X	X	
FEASIBILITY STUDY	X	X	

Design Framework Document (DIP)	X	X	
PROG. FEASIBILITY			X
PROG. DEFINITIVE			X
PROG. EXECUTIVE			X
SUPERVISION AND REALIZATION OF WORKS	X	X	X
TEST			X
MANAGEMENT	X	X	X

### 15.1.6 Relational organization chart

#### 15.1.6.1 Relational organization chart outside the organization

The following paragraphs contain indications in reference to the relationships that Risanamento Spa develops outside its organization in order to carry out the activities that characterize it.

#### 15.1.6.2 Subjects involved

The following table shows the external parties involved in the information processes of Risanamento Spa:

TYPOLOGY	SUBJECT	NOTES
Commissioning	-	
Collaborations	Design studios Specialist studies (surveys, geology, etc.) Professionals (notaries, lawyers, etc.) Other...	
Supply	Hardware Reseller Software Reseller Other...	
Clientele	Public Private	

For the specific identification of the subjects involved, please refer to *Annex A: subjects involved* where the details of each subject are listed and specified.

#### 15.1.6.3 External relations organisation chart

The following diagram shows the organization chart of external relations to Risanamento Spa with reference to what is reported in the table in the previous paragraph:



### 15.1.7 Relational organization chart within the organization

The following paragraphs contain information on the relationships that Risanamento Spa develops internally within its organization in order to carry out the activities that characterize it.

#### 15.1.7.1 Group entities

The following table shows the subjects involved in the processes involved in Risanamento Spa:

TYPOLOGY	ENTITY	RATIO	NOTES
Real estate development/construction	Milano Santa Giulia	Wholly owned	

The following is an example of what is defined in the table above:



Risanamento Spa relies on its 100% subsidiary, Milano Santa Giulia Spa, for real estate development activities. For all other activities (management and maintenance) it organizes its resources as needed.

### 15.1.7.2 Functions/areas of the organization

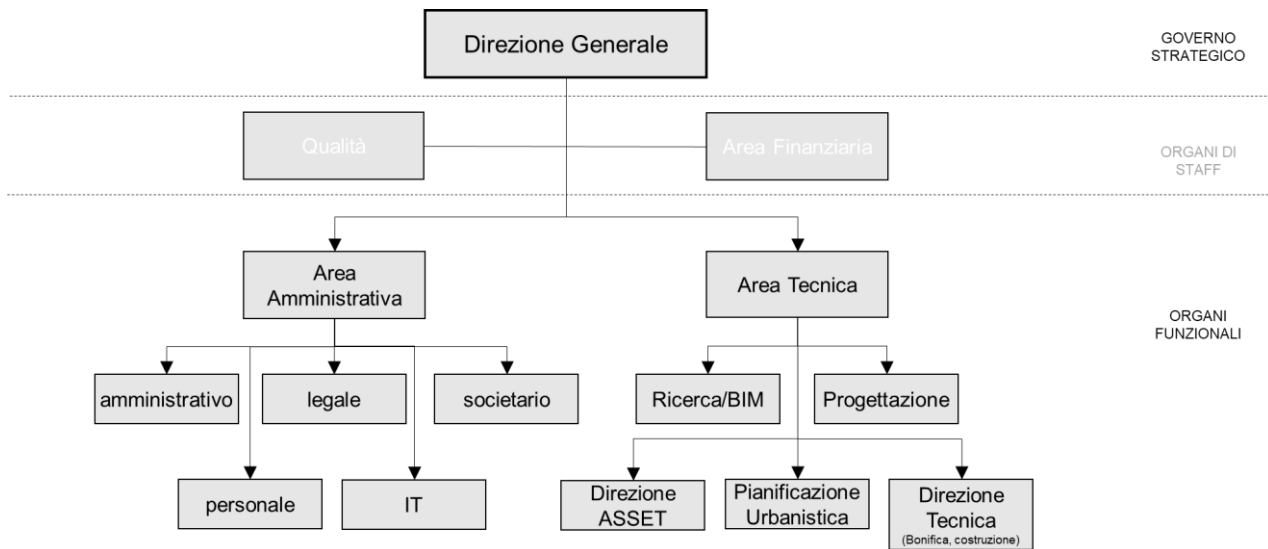
The following table shows the functions and activities carried out by each department that makes up the organization:

AREA/DIP.	FUNCTION	ACTIVITY	RESPONSIB LE	EMAIL	TELEPHONE
General Management					
Quality	Support				
Financial Area	Characteristic				
Administrative Area	Characteristic				
Administrative	Integrative				
Legal	Integrative				
Corporate	Integrative				
Staff	Integrative				
EN	Integrative				
Technical Area	Characteristic				
Search/ BIM	Integrative				
Design	Integrative				
ASSET Management	Integrative				
Urban Planning	Integrative				
Technical Direction	Integrative				

### 15.1.8 4.2.3 Organisation chart of internal relations

The following organization chart shows the internal organization of Risanamento SpA according to the functions identified in the previous point.

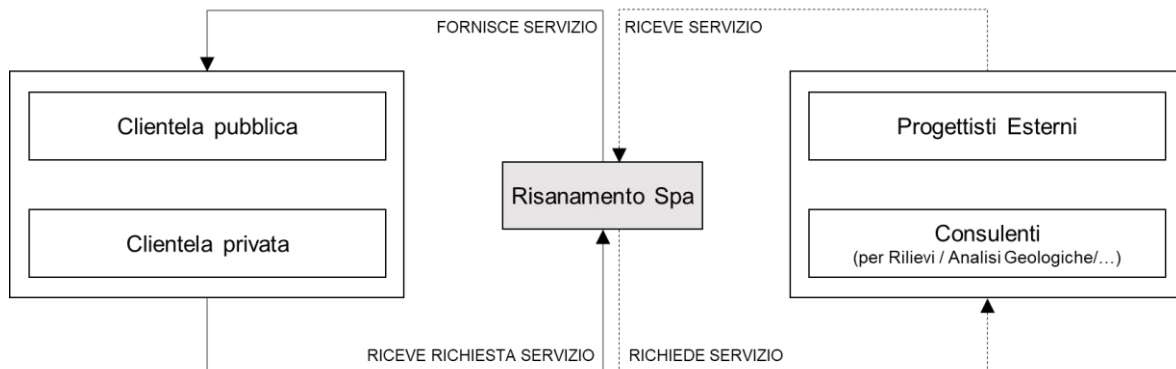




### 15.1.9 5 Information flows

#### 15.1.9.1.1 External information flows of the organization

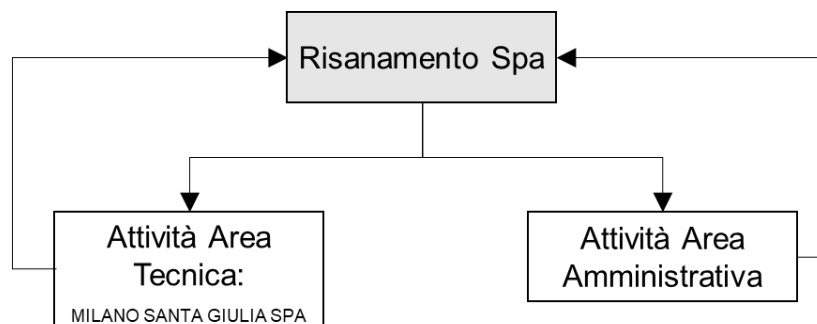
The organization chart below shows the relationship between Risanamento Spa and the companies involved externally.



### 15.1.9.2 Internal information flows of the organization

#### 15.1.9.2.1 Information flows between Group Entities

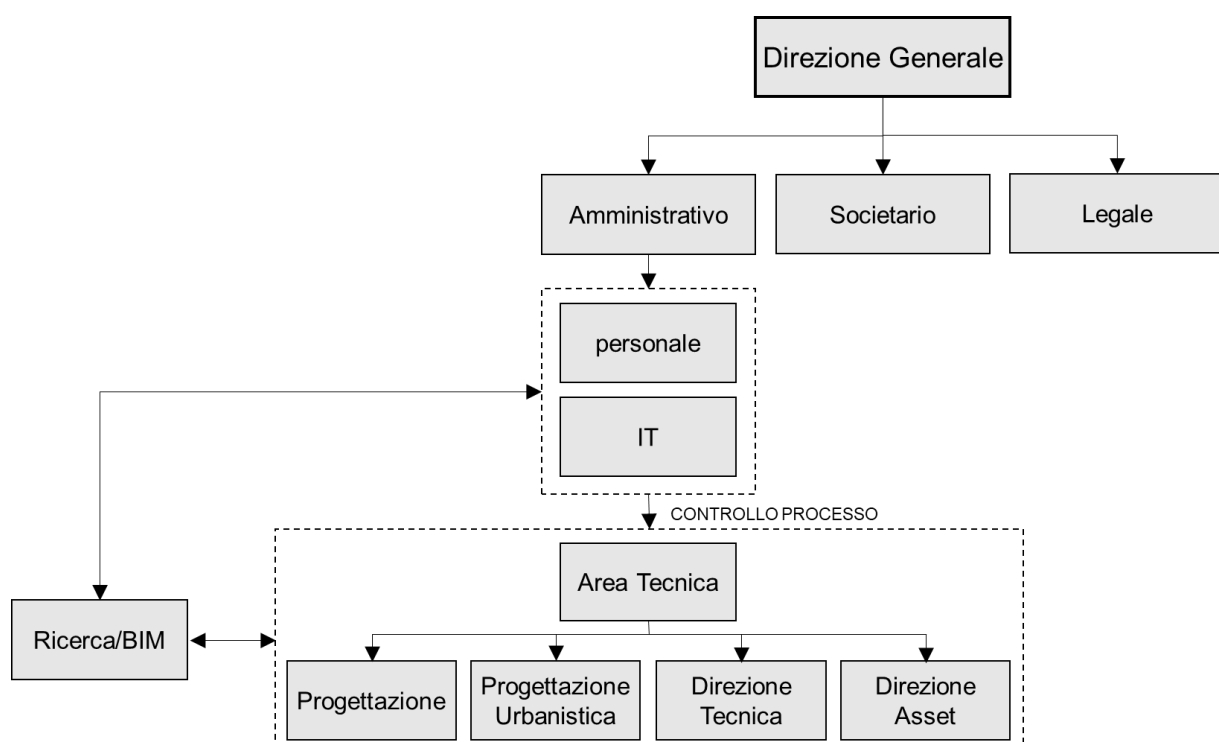
The following graph shows the flow between the Entities of the group defined in the previous paragraphs of this document, with reference to Risanamento Spa:



The input of each activity starts from the company itself. Depending on the type of project, the task is sorted either to the Administrative area of the organization or to the Technical Area, which is identified in the compartment of Milano Santa Giulia Spa (an entity 100% owned by Risanamento Spa).

### 15.1.9.3 Information flows between functions/areas of the organization

The following graph shows the flow between the areas of the organization identified in the organization chart in point 4.2.3 of this document:



The General Management interfaces directly with three areas/functions of its organization: Administrative, Corporate, Legal. The administrative area in collaboration with the personnel and IT area controls all the processes assigned to the technical area and interfaces with the Research area in order to guarantee and ensure that each activity is in line with the innovative development.

### 15.1.10 Dedicated tools

#### 15.1.10.1 Organizational Hardware Tools

The HW computer instrumentation philosophy of the ICT (Information Communication Technology) of the organization is described in response to the information flows (internal and external) identified in the previous chapter 5.

The hardware systems of the organization are defined, describing the technical / performance characteristics essential for the purposes to which they are deputies.

The machines are grouped by technology and performance with indications, for example, of minimum and maximum, age and number of the same.

HARDWARE		
Nr.	Typology	Prevailing features
2	Fixed Workstation	<b>FUJITSU CELSIUS W570</b> Quad Core Xeon E3-1230v6 3.5 GHz (8 MB cache) (C236) -16 GB DDR4 RAM (2400 MHz) -NVIDIA Quadro P600 2 GB ( mini DP adapter -> DP included) -SSD (Solid State Disk) 256 GB Serial ATA III (2.5") (6Gb/s) (ERASE-DISK functionality) -MulCard reader (24 in 1) -DVD SuperMul Serial ATA -LAN (Gigabit)-WinIO Pro 64bit
14	Desktop	<b>FUJITSU EXPRESS P557</b> Quad Core i7-7700 3.6 GHz (8 MB cache) (H110) -8 GB DDR4 RAM (2400 MHz) -SSD (Solid State Disk) 256 GB Serial ATA III (2.5") (6Gb/s) -LAN (Gigabit) -WinIO Pro 64bit
8	Notebook	<b>FUJITSU LIFEBOOK U748</b> Intel Core i5-8250U 1.6 GHz (cache 6 MB) -8 GB DDR4 RAM (2400 MHz) -SSD (Solid State Disk) M.2 256 GB Serial ATA III (Self Encrypng Drive) (ERASE-DISK functionality) -14" (HD) (aluminum-magnesium cover) - Integrated webcam (HD) -Intel Dual Band AC8265NV Wireless LAN & Bluetooth 4.2 -TPM - Biometric idenfication (Palm Vein Sensor) -LAN (Gigabit) - Li Ion (50Wh) -Backlit probe - WinIO Pro 64bit
1	Fastweb Network	Fastnet Fiber: 100Mbts + 100/30 FTTS Fiber Backup
4	Multifunction printer	Konika Minolta BizHub C554E
1	Uninterruptible power supply	Schneider Electric mod. MGE Galaxy 300 20kVA
1	NAS	Netapp FAS 2240 + DS4246 Storage (total capacity 15 Tera)
4	Server	DELL PowerEdge R440

#### 15.1.10.2 Software Tools of the organization

the following table identifies the software used within the organization

SOFTWARE				
Utilization	Model	Brand	Version	N° Workstations
<i>Document management and production:</i>	ARXIVAR	ABLETEC	5	29
	Arcobat DC PRO	ADOBE	2019	29
Suite of desktop applications, servers and services	Office 365 plus	Microsoft	2019	29
Administration and accounting	SAP R/3	SAP	2019	16
Management control	CCH Tagetik	WOLTERS Kluwer	3.0	5

SOFTWARE				
Utilization	Model	Brand	Version	N° Workstations
<i>Operating system:</i>	Windows 10 PRO 64bit	Microsoft	10	29

### 15.1.11 Information security policies

#### 15.1.11.1 Data secrecy

Risanamento Spa, in terms of data secrecy, adopts the General Data Protection Regulation (GDPR) both in reference to the data directly produced, and in reference to those received by it or processed for various reasons.

#### 15.1.11.2 Data security

Risanamento Spa, in terms of data security, adopts the General Data Protection Regulation (GDPR) both in reference to the data directly produced, and in reference to those received by it or processed for various reasons.

## 15.2 7.3 Guarantee of access over time

Risanamento Spa, in terms of guaranteeing access over time data, adopts the General Data Protection Regulation (GDPR) both in reference to the data directly produced, and in reference to those received by it or processed for various reasons.

### 15.2.1 8 Resource Management

#### 15.2.1.1 8.1 Leadership and commitment

The organization demonstrates leadership and commitment to the BIM management system in the following ways:

- ensuring that the policy and objectives related to the BIM management system are compatible with the context and with the strategic guidelines of the organization;
- ensuring the integration of the BIM management system requirements into the organization's business processes;
- ensuring the availability of the resources necessary for the BIM management system;
- communicating the importance of BIM management, and compliance with the requirements of the BIM management system;
- promoting improvement;

#### 15.2.1.2 8.2 Competence and training

The organization with regard to its staff undertakes to:

- determine the skills necessary for people who carry out work activities under its control and that affect the performance and effectiveness of the BIM management system;
- ensure that these people are competent according to education, training, training, or experience;

- where applicable, take action to acquire the necessary skills and assess the effectiveness of the actions undertaken;
- keep appropriate documented information as evidence of competences;
- provide for a professional updating plan.

Applicable actions may include, for example: providing training; mentoring or reallocation of people currently employed; or the hiring or contract assignment of competent persons.

In particular, the organization undertakes to define and ensure an adequate level of competence for the persons who hold the function of:

- information manager (BIM Manager);
- information coordinator (BIM Coordinator);
- information modeler (BIM Specialist);
- ACDat manager (CDE Manager).

The presence of professional certification for the functions listed above of BIM Manager, BIM Coordinator, BIM Specialist and CDE Manager is considered by the organization a sufficient element to ensure compliance with the competence requirements. In the absence of the professional certification referred to above, the level of competence must be demonstrated by means of detailed documentation on the previous experiences of the individuals involved and matured in appropriate time frames.

If the function is held by several people working in a group, the competence requirements defined by the UNI 11337-7 standard can be met by all the knowledge, skills and competences of all group members.

#### **15.2.1.3 8.3 Actions to address risks and opportunities**

The organization must consider external and internal factors relevant to its purposes and influencing its ability to achieve expected results for its BIM management system; as well as identifying the stakeholders / involved in BIM Management processes and their expectations and requirements in order to:

- ensure that the BIM management system can achieve the expected results;
- prevent or reduce side effects;
- achieve improvement.

For this reason, the Organization must plan:

- actions to address risks and opportunities;
- how to integrate and implement the actions in the processes of its BIM management system;
- evaluate the effectiveness of such actions.

## 15.3 Organization Information Requirements – OIR



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# Organization Information Requirements – OIR

Information requirements of the organization

Annex A



RISANAMENTO SpA

## Index

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15.3.3	Information Requirements of the organization.....	128

### 15.3.1 Introduction

This document is Annex A to the OIL Organization Information Guidelines.  
For a better understanding of the Organization Information Requirement (OIR), reference should also be made to the Organization Information Guidelines (OIL) and the Organization Information Map (OIM).

#### 15.3.1.1 Regulatory references

##### 15.3.1.1.1 Rules

There are no specific reference standards.

##### 15.3.1.1.2 Standards

Reference is made to the following Standards:

- UNI EN ISO 19650-1:2018 - *Organization and digitization of information related to construction and civil engineering works, including Building Information Modelling (BIM) - Information management through Building Information Modelling - Part 1: Concepts and principles*
- UNI EN ISO 19650-2:2018 - *Organization and digitization of information relating to construction and civil engineering works, including Building Information Modelling (BIM) - Information management through Building Information Modelling - Part 2: Phase of delivery of real estate assets*
- UNI EN ISO 9000:2015 - *Quality management systems - Fundamentals and vocabulary*
- UNI EN ISO 9001:2015 - *Quality management systems – Requirements*
- UNI EN ISO 9004:2018 - *Quality management - Quality of an organization - Guidelines for achieving lasting success*

#### 15.3.1.2 Acronyms and glossary

ACRONYMS	DEFINITION TERMS
	Requirements
	Required qualities and conditions necessary to achieve a goal.

For any other term of an informative nature, reference is made to the mandatory legislation in question and, below, to the voluntary technical standard (UNI 11337 standard, CEN standards, ISO standards, if not in contrast).

### 15.3.2 Scope

The purpose of this document is to identify the information requirements of the organization by providing useful information to the subsequent manuals on Asset and Project requirements (AIR – PIR) and for the drafting of Asset and Project models (AIM – PIM).

### 15.3.3 Information Requirements of the organization

#### 15.3.3.1 External requirements

The following table shows on the one hand the subjects involved in relations outside the organization (refer to paragraph *Subjects involved* in the Organization Information Guidelines – OIL) and on the other hand the information requirements necessary for each of them:



SUBJECT	INFORMATION REQUIREMENTS	
	INPUT	OUTPUT
Design studios	Minimum reference standards; Reference standards; Other...	Design patterns; Coordination and verification models; As-built models; Asset models; Management and maintenance models. Quote for purchase.
Specialist studies (surveys, geology, etc.)	Information and purpose of the intervention; Design guidance document; Other...	Specialized models and elaborations (e.g. point clouds, geology report, local seismic response, etc.) Quote for purchase.
Professionals (notaries, lawyers, etc.)	Type of documentation required by type of administrative act; Other...	Processed for specific documentation (succession, deeds of sale, etc.) Quote for purchase.
Hardware Reseller	Needs description	Appropriate technical specifications; Products suitable for the activity (e.g. computers, monitors, etc.) Quote for Hardware purchase.
Software Reseller	Needs description	Commercial and descriptive documentation of the product; Quote for software purchase.

### 15.3.3.2 Internal requirements

#### 15.3.3.2.13. Group Entities

The following table shows on the one hand the subjects involved in the internal relations of the organization (refer to paragraph *Entity of the Organization Information Guidelines (OIL)*) and on the other hand the necessary information requirements for each of them:

ENTITY	INFORMATION REQUIREMENTS	
	INPUT	OUTPUT
Milan Santa Giulia	Administration services (economic resources)	Technical data relating to the project (e.g. Obligations towards the public administration, Time and costs of the intervention, etc.)

#### 15.3.3.2.2 Functions/areas of the organization

The following table shows on the one hand the areas/departments of which the organization is composed (refer to paragraph *Functions/areas of the organization* of the Organization Information Guidelines (OIL)) and on the other hand the information requirements necessary for each of them:

AREA/DEPARTMENT	INFORMATION REQUIREMENTS	
	INPUT	OUTPUT


## 15.4 Organization Information Requirements – OIR



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# Organization Information Maps – OIM

Information maps of the Organization

Annex A1



**RISANAMENTO SpA**

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### 15.4.1 Introduction

This document is Annex A1 to the OIL Organization Information Guidelines. For a better understanding of the Organization Information Map (OIM), reference should also be made to the Organization Information Guidelines (OIL) and the Organization Information Requirement (OIR).

### 15.4.2 Regulatory references

#### 15.4.2.1 Laws

There are no specific reference standards.

#### 15.4.2.2 Standards

Reference is made to the following Standards:

- UNI EN ISO 19650-1:2018 - *Organization and digitization of information related to construction and civil engineering works, including Building Information Modelling (BIM) - Information management through Building Information Modelling - Part 1: Concepts and principles*
- UNI EN ISO 19650-2:2018 - *Organization and digitization of information relating to construction and civil engineering works, including Building Information Modelling (BIM) - Information management through Building Information Modelling - Part 2: Phase of delivery of real estate assets*
- UNI EN ISO 9000:2015 - *Quality management systems - Fundamentals and vocabulary*
- UNI EN ISO 9001:2015 - *Quality management systems – Requirements*
- UNI EN ISO 9004:2018 - *Quality management - Quality of an organization - Guidelines for achieving lasting success*

### 15.4.3 Acronyms and glossary

ACRONYMS	DEFINITION TERMS
GIS	Geographic information system or also territorial information system Tool for analyzing, representing and interrogating geographic information.

For any other term of an informative nature, reference is made to the mandatory legislation in question and, below, to the voluntary technical standard (UNI 11337 standard, CEN standards, ISO standards, if not in contrast).

### 15.4.4 Scope

The purpose of this document is to identify the information requirements of the organization by providing useful information to the subsequent manuals on Asset and Project requirements (AIR – PIR) and for the drafting of manuals on Asset and Project models (AIM – PIM).

### 15.4.5 Information structure of GIS maps

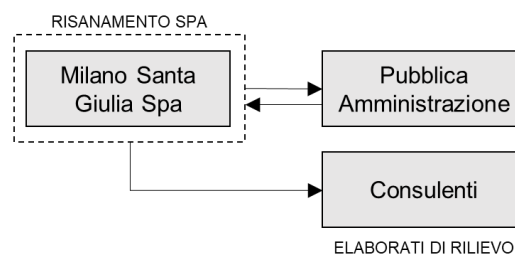
Risanamento SpA is not equipped with GIS maps useful for activities. However, Risanamento SpA retrieves the data and information relevant to the areas of interest from the urban planning information provided by the specific Municipality of reference; subsequently, once the area of intervention has been defined, through surveys and analysis it establishes a starting information base to refer to.

The reference coordinates of each land or property considered, in fact, are indicated as in the following scheme:

REFERENCE SYSTEM	
Point ID	
X	
Y	
Z	

#### 15.4.6 Information structure of the documents

The works developed by Risanamento SpA starting from the maps described above are useful for design development and follow the following flow:



The works referred to for this purpose are:

- Cad Relief;
- Point cloud relief;
- Other...

#### 15.4.7 GIS object library information structure

In the GIS maps described in the previous paragraphs, there are no GIS object libraries.

## 15.5 Asset Information Guidelines – AIL



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# Asset Information Guidelines – AIL

Manual of information management of real estate assets

Annex B



RISANAMENTO SpA

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### 15.5.1 Introduction

This document represents Annex B to the OIL Organization Information Guidelines on asset level. The Asset Information Guidelines (AIL) are also completed through the Asset Information Requirements (AIR) and the Asset Information Model (AIM), which are also annexes of the OIL ( B1 and B2).

Please note that the general information flow is shown in Fig. 1 of the Organization Information Guidelines – OIL.

### 15.5.2 1 Regulatory references

#### 15.5.2.1 Rules

There are no specific reference standards.

#### 15.5.2.2 Standards

Reference is made to the following Standards:

- UNI EN ISO 19650-1:2018 - *Organization and digitization of information related to construction and civil engineering works, including Building Information Modelling (BIM) - Information management through Building Information Modelling - Part 1: Concepts and principles*
- UNI EN ISO 19650-2:2018 - *Organization and digitization of information relating to construction and civil engineering works, including Building Information Modelling (BIM) - Information management through Building Information Modelling - Part 2: Phase of delivery of real estate assets*
- ISO 55000: 2014 Asset management – Overview, principles and terminology
- ISO 55001: 2014 Asset management – Management systems – Requirements

### 15.5.3 Acronyms and glossary

ACRONYMS	DEFINITION TERMS
	<p>Asset</p> <p>English term that indicates, in a very broad sense, any material or immaterial entity susceptible to economic evaluation for a certain subject. In the absence of a satisfactory classification, the classic distinction between tangible and intangible assets (→ also assets) can be used. Among the first are land, crops (vineyards, orchards, etc.), buildings for residential use (homes), industrial (factories, warehouses) or commercial (shops, offices), machinery, tools, raw materials, semi-finished products, products; among the latter, trademarks, patents, concessions. Increasingly, however, the rights related to the use and exploitation of assets, whether tangible or intangible, are concentrated in financial securities representing the rights themselves. In recent times, the range of securities has expanded considerably: alongside the classic ones, such as shares and bonds, private or issued by states or other public institutions, there are now stock indices, currencies, closed-end or open-</p>

		ended mutual funds and derivative assets. The latter are assets whose value depends (derives) on that of an underlying asset (→ derivative). Counterpart of the a. are the liabilities, or the passive items of a balance sheet. (TRECCANI DICTIONARY)
	Asset management	A. selection technique (also called a. allocation), conducted individually or by classes in such a way as to achieve the best risk-return combination of the portfolio of assets resulting from such selection. Among the classes are distinguished: cash or equivalents such as money market funds, fixed income assets (such as bonds and multi-year treasury bills), shares, real estate, precious metals, natural resources, currencies, derivatives, insurance products. (TRECCANI DICTIONARY)
ACDat	Data Sharing Environment	Digital environment for organized collection and sharing of data relating to models and digital works, referring to a single work or a single complex of works. (ISO 19650-1:2018)
ACDoc	Document Sharing Environment	Paper archive, for the sharing of non-digital documents, referring to a single work or a single set of works. (ISO 19650-1:2018)
CDE Manager	Data sharing environment manager	
BIM Manager	Digitalized Process Manager	The BIM manager operates mainly at the level of the organization, with regard to the digitization of processes. The BIM manager, in collaboration with the BIM coordinator, collaborates with the CDE manager, even when the latter belongs to a third party organization, taking into account the evolution of the environment from document sharing to data processing. The BIM manager works with the project manager, as part of the integrated management of information processes and decision-making processes.
BIM Coordinator	Coordinator of information flows	The BIM coordinator operates at the level of the individual order, in concert with the top management of the organization and according to the indications of the BIM manager in the overall management of digitalized processes.
BIM Specialists	Advanced operator of information management and modeling	The BIM specialist acts within the individual orders and operates through certain digitalized procedures through object modeling. It interfaces mainly with the BIM coordinator for the coordination and validation of the models and with the BIM manager to identify the instrumental resources useful for carrying out the order
	Code Checking	Verification and control of geometric interferences between objects, models and works from different disciplines.

	Clash Detection	Verification and regulatory control (geometric / alphanumeric), on the models taken into consideration, through rule-set (set parametric rules).
--	-----------------	--

For any other term of an informative nature, reference is made to the mandatory legislation in question and, below, to the voluntary technical standard (UNI 11337 standard, CEN standards, ISO standards, if not in contrast).

#### 15.5.4 Purpose

The purpose of this document is to identify the activities, flows and tools used within the asset area of Risanamento SpA.

#### 15.5.5 Activities

##### 15.5.5.1 Information benchmark

Risanamento Spa has as its asset the management of an income real estate portfolio (Grosio). The prominent references to which Risanamento Spa is inspired for the accomplishment of the following areas:

1. Idea Real Estate;
2. Nexity;
3. Other...

For the table on information barriers, please also refer to the homonymous paragraph of the Organization Information Guidelines – OIL.

The digitalization of the information system brings advantages to the entire asset area, which can be summarized through the SWOT analysis shown in the following table:

INTERNAL FACTORS	STRENGTHS (S)	WEAKNESSES (W)
	Improved efficiency Improved verification time Alignment with Legislative Decree 50/2016 Other...	High economic investment Other...
FACTORS LOCATIONS	OPPORTUNITY (O)	THREATS (T)
	Effective and linear communications Better control of the real estate portfolio No loss of information Other...	Poor diffusion of the methodology  Poor interoperability to the outside Other...

##### 15.5.5.2 Products and services

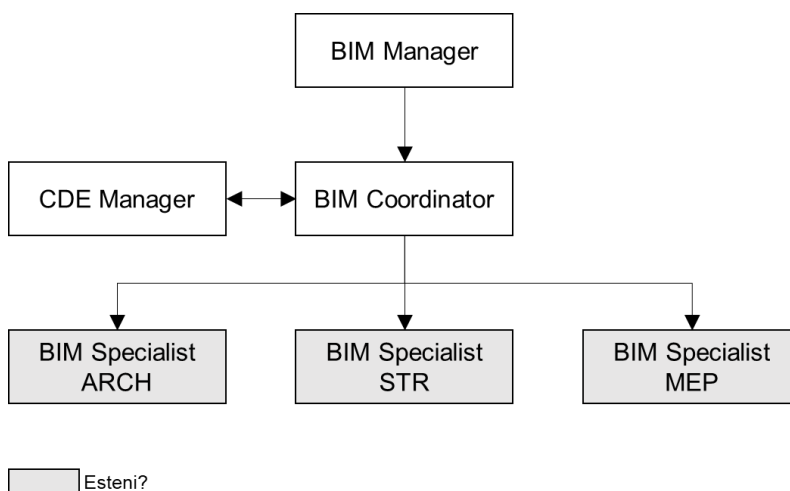
Risanamento Spa offers the management and maintenance service of buildings and land through:

- 1 Management/Asset Models

## 15.5.6 Relational organization chart of asset management

### 15.5.6.1 Organization chart of management information roles

The following figure shows the organization chart relating to the roles and management information functions related to the Asset of Risanamento SpA.



ROLE	NAME	EMAIL	TELEPHONE	ACTIVITY
CDE Manager				The CDE manager confronts the BIM Manager and the BIM Coordinator for the structuring of the CDE. The CDE manager manages the data sharing platform.
BIM Manager				The BIM Manager establishes the information rules for asset management.
BIM Coordinator				The BIM Coordinator receives the information from the BIM Manager and coordinates the activities of the BIM Specialists.
BIM Specialist ARCH				BIM Specialists follow the directives of the BIM coordinator and develop the model
BIM Specialist STR				
BIM Specialist MEP				

### 15.5.6.2 Matrix of information responsibilities

The table below shows the responsibilities of each role identified in the previous paragraph.

ACTIVITY	<i>CDE manager</i>	<i>BIM manager</i>	<i>BIM coordinator</i>	<i>BIM Specialist ARCH</i>	<i>BIM Specialist STR</i>	<i>BIM Specialist MEP</i>
Definition of information rules						
Incoming documentation verification						
Check outbound documentation						
Approval						
Clash/Code on coordinated models						
Clash/Code on individual models						
Model development						
Information Specifications, Offer and Information Management Plan						

R = Responsible – Responsabile

A = Accountable – Responsabile for the result

C = Consulted - Consultato

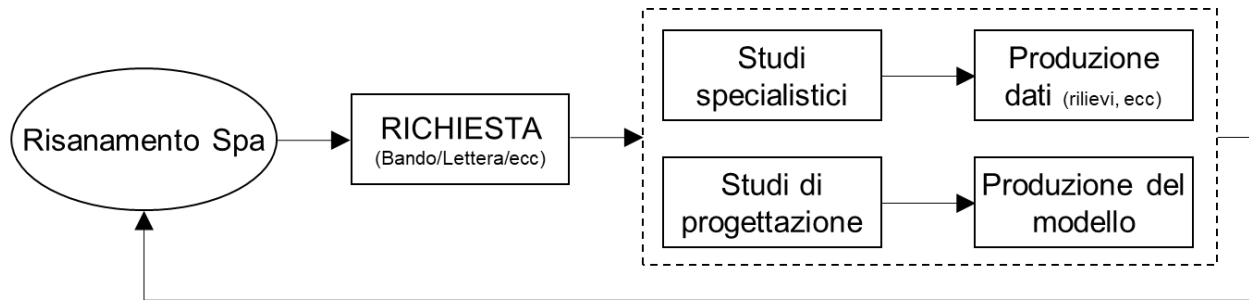
I = Informed - Informato

### 15.5.7 Information flows of asset management

#### 15.5.7.1 External information flows

The figure below shows the flow followed for the start of asset management activities between Risanamento SpA and the external parties involved during the process.

For the generic identification of the subjects involved, please refer to section 4.1.1 *Subjects involved* in the Organization Information Guidelines – OIL. For specific identification, however, please refer to Annex A: subjects involved where the details of each subject are listed and specified.

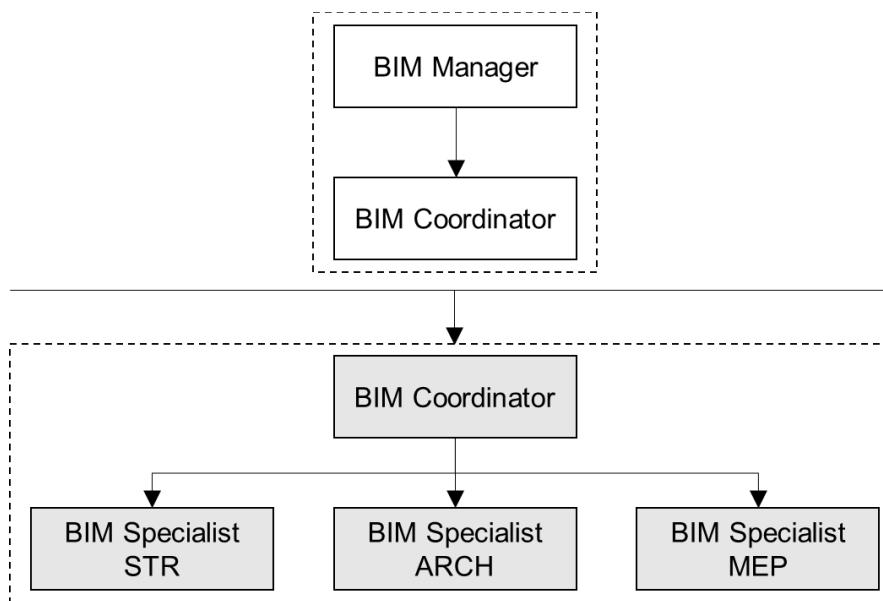


Every activity started with external collaborators starts from an explicit request from Risanamento Spa, through Calls, Invitation Letters and the like. Following the selection, the Design Studio and /or the specialist studio have the task of delivering the products requested by Risanamento Spa, following the digital and informative conditions included in the Product Information Specifications for the specific order.

### 15.5.7.2 Internal information flows

The figure below shows the internal information flow of Risanamento Spa with reference to asset management.

For the identification of the figures involved internally, please refer to paragraph 4.1 *Organization chart of the management information roles* of this document.



The management activities internally at Risanamento Spa are controlled by the BIM Manager and the BIM Coordinator, where it is a matter of "connecting" documents useful during the management phase to the asset model. If there is a need to make changes directly on the model, these two figures have the task of communicating any changes or updates to the external BIM Coordinator indicated for the project in question, who will take care of updating the asset model through the BIM Specialists and delivering it updated to Risanamento Spa.

### 15.5.8 Coordination flows

In the case of the Asset, specific Coordination flows between models and / or actors of the process are not adopted because the only activity to be carried out is to "connect" useful documents during the management phase to the model developed for this purpose.

However it is necessary and useful to check that, for example:

- 2 The model is correctly exported in IFC 2X3 format;
- 3 The model thus exported contains Premises and Real Estate Units (U.I.);
- 4 The model thus exported is divided into AFO and ASO;
- 5 Each object is correctly linked to the necessary technical documentation;
- 6 Other...

### 15.5.9 Verification flows

Each asset model is subjected to a verification process whenever there are changes to the initial conditions (internal / external restructuring, etc.). Each verification must follow the indications specified in the homonymous paragraph of the Project Information Guidelines – PIL.

### 15.5.10 Dedicated tools in asset management

#### 15.5.10.1 Hardware tools

The following table shows the hardware tools used by Risanamento S.p.A.:

HARDWARE		
Nr.	Typology	Prevailing features
	Fixed Workstation	
	Monitor	
	NAS	
	Telecom Italia Business Network	
	Multifunction printer	
	Uninterruptible power supply	

#### 15.5.10.2 Software Tools

The following table shows the software tools used by Risanamento S.p.A.:

SOFTWARE				
Utilization	Model	Brand	Version	N° Workstations
<i>Coordination:</i>				
	usBIM.platform	ACCA Software		

## 15.6 Asset Information Requirements – AIR



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# Asset Information Requirements – AIR

Information requirements of real estate assets

Annex B1



**RISANAMENTO SpA**



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### 15.6.1 Introduction

This document represents Annex B1 to the OIL Organization Information Guidelines relating to the Asset level.

The Asset Information Requirements (AIR) is also completed through the Asset Information Guidelines (AIL) and the Asset Information Model (AIM), which are also annexes to the OIL (to B and B2).

Please note that the general information flow is shown in Fig. 1 of the Organization Information Guidelines – OIL.

### 15.6.2 Regulatory references

#### 15.6.2.1 Rules

There are no specific reference standards.

#### 15.6.2.2 Standards

Reference is made to the following Standards:

- UNI EN ISO 19650-1:2018 - *Organization and digitization of information related to construction and civil engineering works, including Building Information Modelling (BIM) - Information management through Building Information Modelling - Part 1: Concepts and principles*
- UNI EN ISO 19650-2:2018 - *Organization and digitization of information relating to construction and civil engineering works, including Building Information Modelling (BIM) - Information management through Building Information Modelling - Part 2: Phase of delivery of real estate assets*
- ISO 55000: 2014 Asset management - Overview, principles and terminology
- ISO 55001:2014 Asset management - Management systems - Requirements

### 15.6.3 Acronyms and glossary

ACRONYMS	DEFINITION TERMS	
	Objective	The specific purpose for which the model or object is requested . Ex: obtaining authorizations, documentation concerning the fire brigade, information necessary for the economic evaluation of the project, etc.
	Use	Specific use of the data and information contained in the model or object. Ex: extraction of information related to materials, dimensions, quantities, etc.
	Model	Information vehicle for the virtualization of products and processes in the construction sector. (UNI EN ISO 19650/11337-1)
	Object	Virtualization of geometric and non-geometric attributes of finite spatial entities, related to a work, or to a complex of works, and their processes. (UNI EN ISO 19650/11337-1)
	Delivery	Transfer of data, information or documents intended as a result of a certain activity and transmitted at the end of a specific time. Literally: Deliveries.

LOIN	Level of Information Required	Framework defining the scope and granularity of "information"; reinterpretable representation of data in a formalized way suitable for communication, interpretation or processing. (ISO 19650)  LOIN= LOG+LOI+DOC LOIN= LOD+DOC
LOD	Level of development of digital objects	Level of depth and stability of the data and information of the digital objects that make up the models. For uniformity with the terminology adopted in the international field, "LOD" is used as deduced from the English language "Level of Development". (UNI EN ISO 19650/11337-4)  LOD= LOG+LOI
LOI	Information level of objects – geometric attributes	Level of depth and stability of the geometric attributes of the digital objects that make up models. Constituent part of the LOD, together with the LOI, referring to the geometric attributes. (UNI EN ISO 19650/11337-4)
LOG	Information level of objects – informational attributes	Level of depth and stability of the information attributes of the digital objects that make up models. Constituent part of the LODs, together with the LOGS, referring to the non-geometric attributes. (UNI EN ISO 19650/ 11337-4)
DOC	Information level of documents	Level of depth of the input documents for the drafting of the models and of output from the models themselves.

For any other term of an informative nature, reference is made to the mandatory legislation in question and, below, to the voluntary technical standard (UNI 11337 standard, CEN standards, ISO standards, if not in contrast).

#### 15.6.4 Purpose

The purpose of this document is to identify the information requirements necessary for the asset area of the organization. The ultimate goal is to group all the information into a single document.

#### 15.6.5 Information structure, Operating LOIN

The phase objectives (LOIN) are listed below with reference to the operating status.

STATE	PHASE	OBJECTIVE
Exercise	Management and Maintenance	UNI 10366:2007: Maintenance – Maintenance design criteria

## 15.6.6 Information structure, operating model LOIN

### 15.6.6.1 Objectives and uses of model

For the development of assets, Risanamento SpA uses a management model with the objectives and uses shown in the table:

MODEL	OBJECTIVES	USES
Architectural	Have a model full of useful information for the management of the property (rooms, surfaces, etc ...)	Extract surfaces; Extract areas (real estate unit); Extract maintenance dates; Other...
Structural		
MEP		

## 15.6.7 Preparatory activities

In order to start a real estate management intervention it is necessary, prior to the feasibility study and, therefore, to the final and executive design, to have the documentation to verify the administrative regularity of the buildings and therefore possibly of the buildings to be demolished and rebuilt or of the land on which to plan the intervention.

In particular, it is necessary to acquire the following documentation for the drafting of the model of the state of affairs:

- ...
- ...
- ...

## 15.6.8 Delivery

The deliveries planned by Risanamento SpA for the management of assets are:

- Management model (financial management, costs, revenues, leases, etc.)
- Maintenance model (technical management, etc.)
- 

## 15.6.9 Model documents (DOC)

The following table shows all the extracted (e) or linked (c) to the Asset model. Since this is a management model, specific drawings will not be extracted from it, rather they will be connected processed within the ACCA usBIM.platform platform.

For further clarification on the structuring of the ACDat, please refer to Annexes F/.../.. of the Organization Information Guidelines – OIL.

All useful and necessary documents at this stage must be linked to the objects to which they refer directly through the usBIM.browser viewer of the usBIM.platform.

MODEL	DRAWING	CODE	
Architectural			

Architectural/ Structural/ Plant Engineering			
Legend <div style="margin-left: 100px;"> e drawing extrapolated from model  c drawing related to the model </div>			

## 15.6.10 Information structure, LOIN of operating objects

### 15.6.10.1 Objectives and uses of objects

The objective of digital objects in the operating stage is to guarantee the functionality of each element in the useful life cycle and its possible disposal and replacement; as well as understand the consequent costs and consumption.

Use of digital objects in the stage of operation is to ensure the extraction of the information necessary for the technical / economic management of the property.

For example, the above usage attributes and objective such as:

- ...
- ...
- ...

### 15.6.10.2 Object processing

Each object of the asset model must be linked through links and attributes to the following useful documents during the management phase:

- ...
- ...
- ...



## 15.7

## Asset Information Model – AIM

### TEMPLATE

# Asset Information Model – AIM

Information model of real estate assets

Annex B2

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### 15.7.1 Introduction

This document represents Annex B2 to the OIL Organization Information Guidelines regarding the asset level.

The Asset Information Model (AIM) is also completed through the Asset Information Guidelines (AIL) and the Asset Information Requirement (AIR), which are also annexes of the OIL (B and B1).

Please note that the general information flow is shown in Fig. 1 of the Organization Information Guidelines – OIL.

### 15.7.2 Regulatory references

#### 15.7.2.1 Laws

Reference is made to the following standards:

- Legislative Decree 50/2016 and subsequent .m.i.
- MIT Ministerial Decree no. 560 of 1.12.2017

### 15.7.3 Standards

Reference is made to the following Standards:

- UNI EN ISO 19650-1:2018 - *Organization and digitization of information related to construction and civil engineering works, including Building Information Modelling (BIM) - Information management through Building Information Modelling - Part 1: Concepts and principles*
- UNI EN ISO 19650-2:2018 - *Organization and digitization of information relating to construction and civil engineering works, including Building Information Modelling (BIM) - Information management through Building Information Modelling - Part 2: Phase of delivery of real estate assets*
- ISO 55000: 2014 Asset management - Overview, principles and terminology
- ISO 55001:2014 Asset management - Management systems - Requirements
- UNI EN ISO 19650/11337-1 - *Construction and civil engineering works - Digital management of construction information processes - Part 1: Models, documents and information objects for products and processes*
- UNI EN ISO 19650/11337-3 - *Construction and civil engineering works - Criteria for coding construction works and products, activities and resources - Part 3: Models for the collection, organization and storage of technical information for construction products*
- UNI EN ISO 19650/11337-4 - *Construction and civil engineering works - Digital management of construction information processes - Part 4: Evolution and information development of models, drawings and objects*
- UNI EN ISO 19650/11337-5 - *Construction and civil engineering works - Digital management of construction information processes - Part 5: Information flows in digitalized processes*
- UNI EN ISO 19650/11337-6 - *Construction and civil engineering works - Digital management of construction information processes - Part 6: Guidelines for the preparation of the information specifications*
- UNI EN ISO 19650/11337-7 - *Construction and civil engineering works - Digital management of construction information processes - Part 7: Knowledge, skills and competence requirements of the figures involved in the management and information modeling*



#### 15.7.4 Acronyms and glossary

ACRONYMS	DEFINITION TERMS	
	Object libraries	Digital environment for organized collection and sharing of objects for graphic and alphanumeric models. UNI EN ISO 19650/11337-1
	Informative (or drawings) paper	An information process is defined as the vehicle for the representation and contractualization of a product or a process in the construction sector through information content of a graphic, documentary (alphanumeric), multimedia... The information papers, ..., are divided into: <ul style="list-style-type: none"> <li>• Graphs (graphic representation: drawings, technical tables, etc.);</li> <li>• Documentary (alphanumeric representation: relationships, calculations, contracts, etc.);</li> <li>• Multimedia (multimedia representation: audio, photos, movies, etc.).</li> </ul> (UNI EN ISO 19650/11337 – 1)
	Information model (or model)	An information model is defined as the vehicle for the simulation and contracting of a resulting product or a process in the construction sector, through information content of a graphic, documentary (alphanumeric) and multimedia nature. (UNI EN ISO 19650/11337 – 1)

For any other term of an informative nature, reference is made to the mandatory legislation in question and, below, to the voluntary technical standard (UNI 11337 standard, CEN standards, ISO standards, if not in contrast).

#### 15.7.5 Purpose

The purpose of this document is to identify the information structure of the models, documents, and library of objects produced for the Organization's Asset.

#### 15.7.6 Information structure of graphic models

##### 15.7.6.1 Modelling rules

The asset model is a model that follows the same principles as a project model (maximum file size, coordinate system, insertion of objects, attributes); but differs from the latter in the type of information from which it is populated. The Asset model, in fact, is configured as an as-built model unloading of the data necessary in the design / construction phase and superfluous in the management phase (example: number of reinforcing irons, etc.).

### 15.7.6.2 Architectural Asset Model

The Architectural Asset Model must be generated starting from an As-built Model contained within the ACDat.

The As-built Model must undergo the following changes in order to become an Asset Model:

- ...
- ...
- ...

### 15.7.6.3 Structural and Plant Asset Model

With regard to the management of structural or plant parts, the Asset model referred to these disciplines will be generated and will undergo the same processes described for the Architectural Asset Model.

### 15.7.6.4 Maximum size of modelling files

The developed models, as described in the previous paragraph, have a minimum size of xx MB and a maximum of 300 MB.

### 15.7.6.5 Common system of coordinates and reference specifications

In the Master Model, the coordinate system received through the survey must be used. By way of example, there is a useful table to specify the coordinates to be used:

ABSOLUTE REFERENCE SYSTEM	
Argument	Specification
Intersection grids XX and YY	...
Altimetry	
Rotation according to the real north	
Ground floor PPF	
...	
OTHER PROPOSED REFERENCES	
Argument	Specification
Origin of the axis system	
Offsets and distances between axes	
Encoding axes or grids	
Units of measurement	
...	

### 15.7.6.6 Specification for inserting digital objects into models

All asset models must be developed from an as-built model derived from the Project area. Each object, therefore, will follow modeling criteria that allow its easy reading, interrogation and subsequent re-elaboration. In particular, in all cases where possible, the rules for a correct parameterization of the elements must be respected by introducing the appropriate geometric constraints.

### 15.7.6.7 Model encoding

The models developed for asset management by Risanamento Spa follow the coding below.

CAMPO 1			CAMPO 2			CAMPO 3				CAMPO 4		CAMPO 5		
DISCIPLINA			FASE PROCESSO			FASE LOCALIZZAZIONE/LAVORAZIONE				DESCRIZIONE		N° PROGRESSIVO		
A	C	acustica	A	B	as built	1	*	*	*	MUDc "1"	abaco	0	0	1
A	R	architettura	B	D	brief design	21	*	*	*	MUDc "21"	collaudo	0	0	2
A	U	arredo urbano	C	L	collaudo	31	*	*	*	MUDc "31"	computo metrico	↓	↓	↓
B	N	bonifica	D	P	doc. indirizzo progettazione						contratto	9	9	9
G	E	geologia/geotecnica	E	S	esercizio	*	A	*	*	UdCP "A"	cronoprogramma			
I	E	impianti elettrici	P	C	progettazione costruttiva	*	B	*	*	UdCP "B"	elenco documenti			
I	I	impianti idrici	P	D	progettazione definitiva	↓	↓	↓	↓	↓	elenco lavorazioni			
I	M	impianti meccanici	P	E	progettazione esecutiva	*	M	*	*	UdCP "M"	elenco prezzi			
I	S	impianti speciali	P	F	progettazione fattibilità						modello			
I	N	infrastrutture	Q	E	quadro esigenziale	*	*	*	604	fondiarìa 604	modello di flusso			
V	F	prevenzione incendi	R	E	realizzazione	*	*	*	V	fondiarie varie	particolari costruttivi			
S	C	sicurezza di cantiere			altre...						piano sicurezza cantiere			
S	S	sottoservizi				I	*	*	*	fase I	pianta			
S	T	strutturale				I	1	*	*	sottofase I.1	planimetria			
S	P	strutture prefabbricate				↓	↓	↓	↓	↓	profilo			
T	P	topografia				I	4	*	*	sottofase I.4	prospetto			
U	B	urbanistica				II	*	*	*	fase II	provvedimento			
V	R	verde				II	1	*	*	sottofase II.1	relazione			
V	I	viabilità				II	2	*	*	sottofase II.2	rendering/foto/video			
		altre.....									sezione			
											stato avanzamento lavori			
											specifica tecnica			
						III	*	*	*	fase III	altre...			
						III	1	*	*	sottofase III.1				
						↓	↓	↓	↓	↓				
						III	4	*	*	sottofase III.4				
										altre....				

ESEMPIO DI DENOMINAZIONE FILE/MODELLO  
AR\_PD\_I14\*604\_Planimetria\_001  
ST\_PE\_21A\*604\_Cronoprogramma\_004

### 15.7.6.8 Model attributes

All Asset Templates are uploaded to usBIM.platform in IFC format. Therefore, specific attributes of reference to the model cannot be counted.

### 15.7.6.9 Information structure of the documents

#### 15.7.6.9.1 Processing generation

No specific processes must be extrapolated from the Asset Model. Each information can be accessed directly by querying the model in the ACCA usBIM.platform.

#### 15.7.6.10 Processed encoding

Since there are no drawings extracted directly from the model, there is no specific and dedicated coding.

#### 15.7.6.11 Object library information structure

#### 15.7.6.12 Object modelling rules

All Asset Templates are uploaded to usBIM.platform in IFC format. Therefore the objects contained in them derive from the model first of design, then as-built and, finally, skimmed of the useless information during the management phase; as indicated in paragraph 3.1 Modeling Rules of this document and in the homonymous paragraph of the Project Information Model – PIM.

#### 15.7.6.13 Encoding objects

Risanamento Spa does not directly produce objects, so for the coding of the objects please refer to the one proposed by the custodian which must in any case be communicated and discussed in time.

#### 15.7.6.14 *Geometric attributes (LOG)*

All the objects produced for management and maintenance are characterized by a low level of geometric detail, sufficient to identify the overall geometries of the object itself and those necessary for maintenance. By way of example, the following table shows the useful and necessary information for this phase:

GEOMETRICS ATTRIBUTES	
•	...
•	...
•	...

#### 15.7.6.15 *Non-geometric attributes (LOIs)*

The non-geometric attributes related to the object are those referring to the correct maintenance and management. By way of example, the following table shows the useful and necessary information for this phase:

NON-GEOMETRIC ATTRIBUTES	
•	...
•	...
•	...

Each Asset model must be characterized by the presence of links to Excel tables containing all the information concerning:

- ...
- ...
- ...

#### 15.7.6.16 *Libraries outside the organization*

Risanamento Spa does not produce models and/or objects. Therefore, each modeling product will be at the head of the trustee who will still be able to make use of objects downloaded from external libraries; specifying, however, their origin.

## 15.8 Project Information Guidelines– PIL



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# Project Information Guidelines – PIL

Project Information Management Manual

Annex C



RISANAMENTO SpA

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### 15.8.1 Introduction

This document represents Annex C to the Information Management Manual – OIL Organization Information Guidelines regarding the design of interventions (construction, restoration, redevelopment, demolition) of an Asset.

The Project Information Guidelines (PIL) is also completed through the Project Information Requirement (PIR) and the Project Information Model (PIM), which are also annexes of the OIL (to C1 and C2).

Please note that the general information flow is shown in Fig. 1 of the Organization Information Guidelines – OIL. In addition, all project indications derive from the information flow of Asset (AIL, AIR, AIM).

### 15.8.2 Regulatory references

#### 15.8.2.1 Laws

Reference is made to the following standards:

- Legislative Decree 50/2016 and subsequent .
- MIT Ministerial Decree no. 560 of 1.12.2017

#### 15.8.2.2 Standards

Reference is made to the following Standards:

- UNI EN ISO 19650/11337-1 - *Construction and civil engineering works - Digital management of construction information processes - Part 1: Models, documents and information objects for products and processes*
- UNI EN ISO 19650/11337-3 - *Construction and civil engineering works - Criteria for coding construction works and products, activities and resources - Part 3: Models for the collection, organization and storage of technical information for construction products*
- UNI EN ISO 19650/11337-4 - *Construction and civil engineering works - Digital management of construction information processes - Part 4: Evolution and information development of models, drawings and objects*
- UNI EN ISO 19650/11337-5 - *Construction and civil engineering works - Digital management of construction information processes - Part 5: Information flows in digitalized processes*
- UNI EN ISO 19650/11337-6 - *Construction and civil engineering works - Digital management of construction information processes - Part 6: Guidelines for the preparation of the information specifications*
- UNI EN ISO 19650/11337-7 - *Construction and civil engineering works - Digital management of construction information processes - Part 7: Knowledge, skills and competence requirements of the figures involved in the management and information modeling*

### 15.8.3 Acronyms and glossary

Here is a legend of the acronyms used and a synthetic glossary of the related terms related to BIM and the digitization of the construction sector in the design of the interventions:

ACRONYMS	DEFINITION TERMS	
BIM	Building Information Modelling	Digitalization system of the building process for the optimization and efficiency of the planning, construction and management of buildings through the use of Information Technology systems. (ISO 19650)
WBS	Working Breakdown Structure	Tree (descending) structuring of activities for programming.
CPM	Critical Path Method	Critical path method.
LC1	Coordination Level 1	Coordination of data and information carried out within a single model.
LC2	Coordination Level 2	Coordination between different individual models.
LC3	Coordination Level 3	Coordination to be carried out between models, information documents generated by models and information documents not deriving from graphic models (for example, technical or calculation reports, CAD graphs, etc.). For each of the disciplines concerned.
LV1	Verification Level 1	Formal internal verification: verification of the correct method of production, delivery and management of information in relation to what is indicated in the IT Specifications and in the Information Management Plan.
LV2	Verification Level 2	Substantial internal verification: verification aimed at ascertaining the readability, traceability and consistency of the information enclosed in the models. It is performed by carrying out a verification of the achievement of the information evolution of the models and drawings and the level of development of objects, required in the phase according to when prescribed in the Information Specifications and in the Information Management Plan.
LV3	Verification Level 3	Formal and substantial verification: verification carried out on what is deposited in the ACDat (data sharing environment) and / or ACDoc (document sharing archive). That verification shall be carried out by a third party.

For any other term of an informative nature, reference is made to the mandatory legislation in question and, below, to the voluntary technical standard (UNI 11337 standard, CEN standards and ISO standards, if not in contrast).

### 15.8.4 2 Purpose

The purpose of this document is to identify the activities, organizational charts, flows and information tools in reference to the design of interventions (from restructuring, demolition and reuse).



## 15.8.5 Activities

### 15.8.5.1 Information benchmark

Risanamento Spa does not deal with pure design, but controls and verifies externally commissioned projects. For this activity it has as an informative reference the following organizations:

4. ...
5. ...
6. ...

For the table concerning information barriers, please also refer to the homonymous paragraph of the Organization Information Guidelines – OIL.

The use of BIM information models brings advantages that can be summarized through the SWOT analysis shown in the following table:

INTERNAL FACTORS	STRENGTHS (S)	WEAKNESSES (W)
	Improved production times Improved verification time Anticipation of construction site problems Other...	Formation Potential Quality/Cost Implementation costs Other...
FACTORS LOCATIONS	OPPORTUNITY (O)	THREATS (T)
	Better information transfer No loss of information Qualitatively better project Other...	Poor diffusion of the methodology Poor Interoperability Other...

## 15.8.6 Products and services

Risanamento Spa offers the following services:

- ...
- ...
- ...

## 15.8.7 Relational organization chart of project management

### 15.8.7.1 Organization chart of the information roles of intervention

The following figure shows the organization chart relating to the roles and information functions of Risanamento S.p.A.

#### FLOWCHART

ROLE	NAME	EMAIL	TELEPHONE	ACTIVITY
CDE manager				The CDE manager confronts the Project Manager and the BIM Coordinator for the structuring of the CDE. The CDE manager manages the data sharing platform.
BIM manager				The BIM Manager establishes the information rules for GREEN BIM.
BIM coordinator				The BIM Coordinator receives the information from the BIM Manager and the Project Manager and coordinates the activities of the BIM Specialists
BIM Specialist				BIM Specialists follow the directives of the BIM coordinator and develop the model

### 15.8.7.2 Matrix of information responsibilities

The table below shows the responsibilities of each role identified in the previous paragraph.

ACTIVITY	CDE manager	BIM manager	Project Manager	BIM coordinator	BIM Specialist ARCH	BIM Specialist STR	BIM Specialist MEP
Definition of information rules							
Incoming documentation verification							
Check outbound documentation							
Approval							

ACTIVITY	<i>CDE manager</i>	<i>BIM manager</i>	<i>Project Manager</i>	<i>BIM coordinator</i>	<i>BIM Specialist ARCH</i>	<i>BIM Specialist STR</i>	<i>BIM Specialist MEP</i>
Clash/Code on coordinated models							
Clash/Code on individual models							
Model development							
Information Specifications , Offer and Information Management Plan							

R = Responsible –

A = Accountable – Responsible for the result

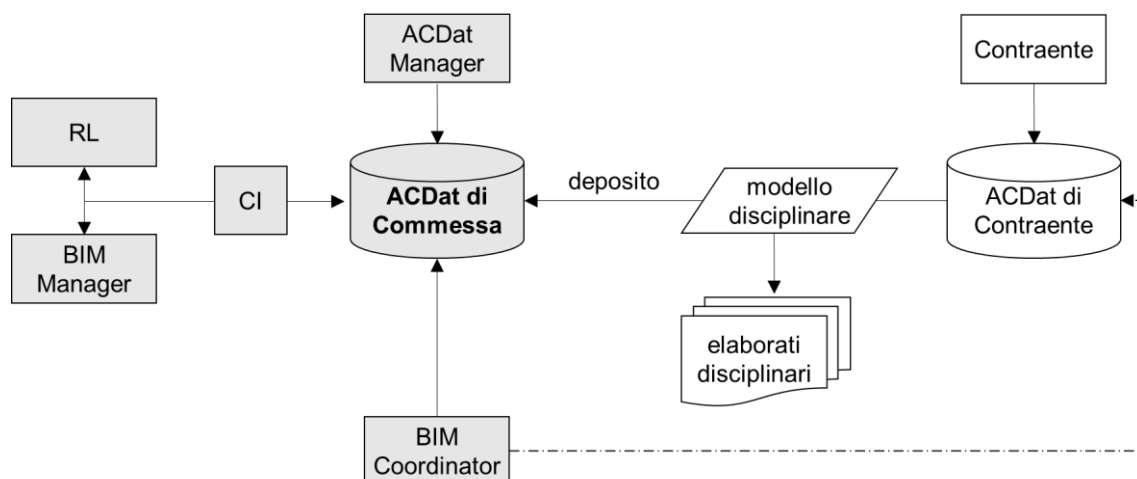
C = Consulted -

I = Informed -

### 15.8.8 Information flows of project management

### 15.8.9 External information flows

Below is an outline representing the information flows external to Risanamento Spa



Information flow of the Client in the Contract

### 15.8.10 Internal information flows

Below is an outline representing the internal information flows of Risanamento Spa

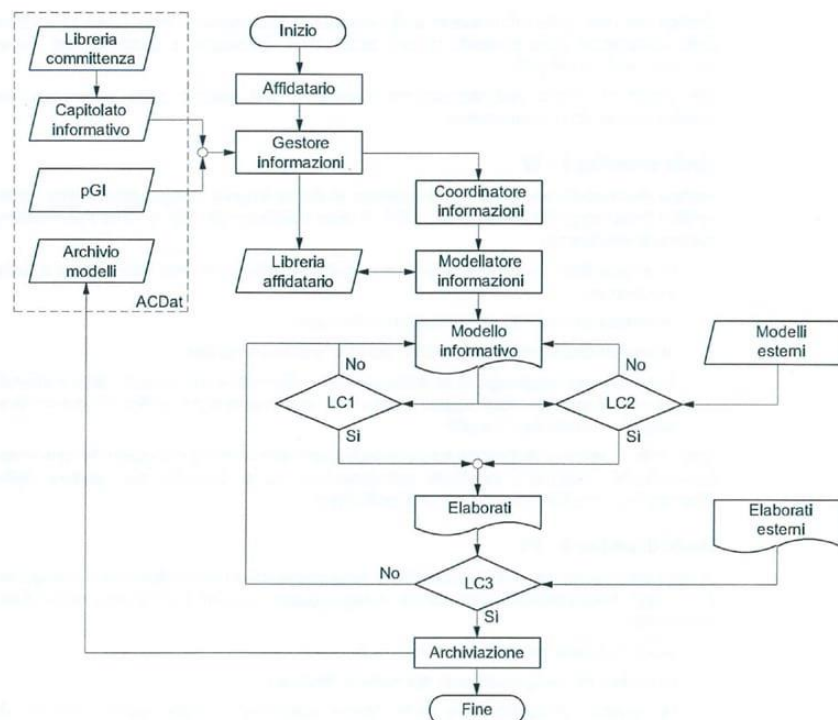
...

### 15.8.11 Coordination flows

The data and information contained in the graphic models belonging to a given digital process must be coordinated with each other and with the reference rules. This coordination (in the same model or between graphic models of the various disciplines) must take place through the verification of interference (clash detection) and relative resolutions of any inconsistencies (code checking) found.

For these coordination checks, three levels are identified, as indicated in UNI 11337 - 5:

- LC1: First level coordination. This is the arrangement of data and information within the graphic model relating to a single discipline;
- LC2: Second level coordination. This is the sorting of data and information among models of the various disciplines. Second-level coordination can take place by means of the simultaneous aggregation of several graphic models (it could be defined as a congruence check).
- LC3: Third level coordination. This is the Coordination of data and information generated by graphic models with data and information external to graphic models (they can be processed both digital and non-digital).



**Levels of Coordination (UNI 11337-5:2017)**

By way of example and not exhaustively, there is a matrix for **clash detection** used by Risanamanento Spa:

- Non-exhaustive example of the coordination table of LC1 models

Model		Architectural							
	Object classes	Ceilings	Doors	Pavim.	Ringh.	Stairs	Walls	Windows	Other...

Arch.	Ceilings								
	Doors								
	Floors								
	Railings								
	Stairs								
	Walls								
	Windows								
	Other...								

LC1 - coordination of interferences of the same graphic model (UNI 11337-5:2017)

- Non-exhaustive example of the coordination table of the LC1 – LC2 models

Model		Architectural							
	<b>Object classes</b>	Ceilings	Doors	Pavim.	Ringh.	Stairs	Walls	Finest.	Other...
Structur e.	Floors								
	Stairs								
	Structural pillars								
	Structural frame								
	Other...								

LC2 - coordination of interferences between a model and other graphic models (UNI 11337-5:2017)

As regards the third-level coordination verification - LC3 a manual execution is foreseen. For this reason we tend to extrapolate as many documents as possible from the model in order to minimize the files not extracted from the model and make this coordination verification as less impactful as possible.

For **Code Checking**, traditional checks must be performed also referring to the following matrix:

MODEL		Building Regulations	Hygiene regulations	Consolidated Law on Construction	Law 10	Q.M. 1444	House plan	NTC 2018	UNI EN	CEI
Architectural	Object									
	Model									
	Processed									
Facilities	Object									
	Model									
	Processed									
BEM	Object									
	Model									
	Processed									
Electric	Object									
	Model									
	Processed									
Mechanical	Object									
	Model									
	Processed									
Plumbing	Object									
	Model									
	Processed									

#### 15.8.11.1 5Verification flows

Within the information process concerning the project, three levels of verification (LV) are identified as per UNI 11337-5:20147:

- LV1 - internal, formal verification;
- LV2 - internal, substantial verification;
- LV3 - independent, formal and substantive verification

Risanamento Spa is responsible for carrying out the level of internal verification LV1 and LV2 by the BIM Coordinators for each model or processed product and by the BIM Manager on a sample basis before their issuance to third parties.

#### 15.8.12 Dedicated tools in project management

##### 15.8.12.1 Hardware tools

The following table shows the hardware tools used by Risanamento Spa:

HARDWARE		
Nr.	Typology	Prevailing features
	Fixed Workstation	

	Monitor	
	NAS	
	Notebook	
	Telecom Italia Business Network	
	Multifunction printer	
	Uninterruptible power supply	

### 15.8.12.2 Software Tools

The following table shows the software tools used by Risanamento Spa:

SOFTWARE				
Utilization	Model	Brand	Version	N° Workstations
<i>BIM authoring:</i>				
Architecture	Autodesk Revit	Autodesk	2019	
Facilities	Autodesk Revit	Autodesk	2019	
Infrastructure	Civil 3D	Autodesk	2019	
	Infrawoks	Autodesk	2019	
<i>CAD:</i>				
2D Drawing	Autocad	Autodesk		
<i>Sharing:</i>				
Of files	usBIM.platform	ACCA		
Construction site	Primus.platform	ACCA		
<i>Verification:</i>				
Detec Clash.	Navisworks	Autodesk	2019	
Code Check.	Autodesk Revit	Autodesk	2019	
<i>Puti cloud management:</i>				
	Recap	Autodesk	2019	

## 15.9 Project Information Requirements



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# Project Information Requirements – PIR

Project information requirements

Annex C1



**RISANAMENTO SpA**



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### 15.9.1 Introduction

This document represents Annex C1 to the Information Management Manual – OIL Organization Information Guideline regarding the design of the interventions (construction, restoration, redevelopment, demolition) of an Asset.

The Project Information Requirement (PIR) is also completed through the Project Information Guidelines (PIL) and the Project Information Model (PIM), which are also annexes of the OIL (to C and C2).

Please note that the general information flow is shown in Fig. 1 of the Organization Information Guidelines – OIL. In addition, all project indications derive from the information flow of Asset (AIL, AIR, AIM).

### 15.9.2 Regulatory references

#### 15.9.2.1 Laws

Reference is made to the following standards:

- Legislative Decree 50/2016 and subsequent.
- MIT Ministerial Decree no. 560 of 1.12.2017

#### 15.9.2.2 Standards

Reference is made to the following Standards:

- UNI EN ISO 19650/11337-1 - *Construction and civil engineering works - Digital management of construction information processes - Part 1: Models, documents and information objects for products and processes*
- UNI EN ISO 19650/11337-3 - *Construction and civil engineering works - Criteria for coding construction works and products, activities and resources - Part 3: Models for the collection, organization and storage of technical information for construction products*
- UNI EN ISO 19650/11337-4 - *Construction and civil engineering works - Digital management of construction information processes - Part 4: Evolution and information development of models, drawings and objects*
- UNI EN ISO 19650/11337-5 - *Construction and civil engineering works - Digital management of construction information processes - Part 5: Information flows in digitalized processes*
- UNI EN ISO 19650/11337-6 - *Construction and civil engineering works - Digital management of construction information processes - Part 6: Guidelines for the preparation of the information specifications*
- UNI EN ISO 19650/11337-7 - *Construction and civil engineering works - Digital management of construction information processes - Part 7: Knowledge, skills and competence requirements of the figures involved in the management and information modeling*

### 15.9.3 Acronyms and glossary

Here is a legend of the acronyms used and a synthetic glossary of the related terms related to BIM and the digitization of the construction sector in the design of the interventions:

ACRONYMS	DEFINITION TERMS

For any other term of an informative nature, reference is made to the mandatory legislation in question and, below, to the voluntary technical standard (UNI 11337 standard, CEN standards and ISO standards, if not in contrast).

### 15.9.4 Purpose

The purpose of this document is to identify the information structure for intervention projects, models and objects.

### 15.9.5 Information structure, design LOIN

#### 15.9.5.1 Process Phase Objectives (LOD)

STATE	PHASE	PHASE OBJECTIVES
Programming	Feasibility study	Legislative Decree 50/2016, art. 25, paragraph 8
Design	Feasibility	Legislative Decree 50/2016, art. 23, paragraph 6; art. 25, paragraphs 8 and 9.; art. 27, paragraphs 3 and 4; art. 147, paragraphs 2 and 3;
	Definitive	Legislative Decree 50/2016, art. 23, paragraph 7; art. 26, paragraph 4; art.27, paragraph 5 and 6
	Executive	Legislative Decree 50/2016, art. 23, paragraph 8; art. 25, paragraph 4; art. 147, paragraph 4;
Execution	Realization of works	Legislative Decree 50/2016, art. 101, paragraphs 3, 4 and 5; art. 149; art. 150; LEGISLATIVE DECREE 81/08
	Test	LEGISLATIVE DECREE 81/08
Operation	Management	
	Maintenance	

## 15.10 Project objectives

STATE	PHASE	PROJECT OBJECTIVE
Design	Feasibility	
	Definitive	
	Executive	
Execution	Realization of works	
	Test	

### 15.10.1 Information structure, project template LOIN

#### 15.10.1.1 Objectives and uses of model

STATE	PHASE	MODELS	OBJECTIVE	USES
Design	Feasibility			
	Definitive			
	Executive			
Execution	Realization of works			
	Test			

### 15.10.2 Preparatory activities

To start the design activity you must have the following information in advance:

- ...
- ...
- ...

#### 15.10.2.1 Delivery

During the determination of the modeling specifications, a delivery plan must be defined where the following information will be identified:

- Definition of Delivery Type  
By way of example, some types of delivery are listed:
  - Graphic Templates
  - Graphic elaborations extracted from the model
  - Graphics not extracted from the model
  - Documentary documents not extracted from the model
  - Clash Reports
  - Other..
- Delivery support  
Deliveries must be made available through:
  - CDE Sharing

#### 15.10.2.2 Model documents (DOC)

Extrapolation table of the drawings to be developed for the design phase.

MODEL	DRAWING	TABLE CODE	
Architectural			
Structural			
BEM			
Mechanical			
Electric			
Plumbing			
Safety			
legend e drawing extrapolated from model c drawing related to the model			

### 15.10.3 Information structure, LOIN of project objects

#### 15.10.3.1 Objectives and uses of objects

STATE	PHASE	OBJECT	OBJECTIVE	USES
Design	Feasibility			
	Definitive			
	Executive			
Execution	Realization of works			
	Test			

#### 15.10.3.2 Object processing

Each object will be linked through links and attributes to the following works:

STATE	PHASE	OBJECT	OBJECT PROCESSING
Design	Feasibility		
	Definitive		
	Executive		
Execution	Realization of works		
	Test		

## 15.11 Project Information Model – PIM



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# Project Information Model – PIM

Project information models

Annex C2



RISANAMENTO SpA

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### 15.11.1 Introduction

This document represents Annex C2 to the OIL Organization Information Guidelines on the design of interventions (construction, restoration, redevelopment, demolition) of an Asset.

The Project Information Model (PIM) is also completed through the Project Information Guidelines (PIL) and the Project Information Requirements (PIR), which are also annexes of the OIL (to C and C1).

Please note that the general information flow is shown in Fig. 1 of the Organization Information Guidelines – OIL. In addition, all project indications derive from the information flow of Asset (AIL, AIR, AIM).

### 15.11.2 Regulatory references

#### 15.11.2.1 Laws

Reference is made to the following standards:

- Legislative Decree 50/2016 and subsequent .m.i.
- MIT Ministerial Decree no. 560 of 1.12.2017

#### 15.11.2.2 Standards

Reference is made to the following Standards:

- UNI EN ISO 19650/11337-1 - *Construction and civil engineering works - Digital management of construction information processes - Part 1: Models, documents and information objects for products and processes*
- UNI EN ISO 19650/11337-3 - *Construction and civil engineering works - Criteria for coding construction works and products, activities and resources - Part 3: Models for the collection, organization and storage of technical information for construction products*
- UNI EN ISO 19650/11337-4 - *Construction and civil engineering works - Digital management of construction information processes - Part 4: Evolution and information development of models, drawings and objects*
- UNI EN ISO 19650/11337-5 - *Construction and civil engineering works - Digital management of construction information processes - Part 5: Information flows in digitalized processes*
- UNI EN ISO 19650/11337-6 - *Construction and civil engineering works - Digital management of construction information processes - Part 6: Guidelines for the preparation of the information specifications*
- UNI EN ISO 19650/11337-7 - *Construction and civil engineering works - Digital management of construction information processes - Part 7: Knowledge, skills and competence requirements of the figures involved in the management and information modeling*



### 15.11.3 Acronyms and glossary

Here is a legend of the acronyms used and a synthetic glossary of the related terms related to BIM and the digitization of the construction sector in the design of the interventions:

ACRONYMS	DEFINITION TERMS	
IFC	Industry Foundation Classes	Open language for saving and exchanging data for graphic models. (UNI EN ISO 16739:2016)
XML	eXtensible Markup Language	
	Systems	Technological, tangible part of a work. More or less articulated composition of subsystems combined with each other due to the common correspondence to an aggregating function. Generally differentiated in construction or architectural systems, structural systems, plant systems, environmental systems. Examples of systems are: the internal walls and the outer shell of a building, the floors, the roofs intended as finished packages. The road massif, the air conditioning system, the elevation structures. (UNI EN ISO 19650/ 11337-1)
	Subsystems	Technological, tangible part of a system belonging to a work. More or less articulated composition of individual components combined with each other due to the common correspondence to an aggregating function. It performs its own characterizing function and is part of a system, performing (or helping to perform) one or more specific functions. Generally differentiated into construction or architectural subsystems, structural subsystems, plant subsystems, environmental subsystems. Examples of subsystems are: the plaster layer, the insulating layer, screeds, etc. understood as functional layers or parts of finished packages. The tout-venant of the road massif, the distribution network of the air conditioning system, the pillar or beam of the elevation structures . (UNI EN ISO 19650/11337-1)

For any other term of an informative nature, reference is made to the mandatory legislation in question and, below, to the voluntary technical standard (UNI 11337 standard, CEN standards and ISO standards, if not in contrast).

### 15.11.4 Scope

The purpose of this document is to identify the information structure of graphic models, drawings and object libraries.

### 15.11.5 Information structure of graphic models

Describe how to create the useful models developed by Risanamento Spa.

### 15.11.5.1 3.1 Modelling rules

#### 15.11.5.1.1 Maximum size of modelling files

The developed models have a minimum size of xxMB and a maximum of xxx MB.

#### 15.11.5.1.2 Common system of coordinates and reference specifications

In the Master Model we will use the system of indicated coordinates received through the survey. By way of example, there is a useful table to specify the coordinates to be used:

ABSOLUTE REFERENCE SYSTEM	
Argument	Specification
Intersection grids XX and YY	...
Altimetry	
Rotation according to the real north	
Ground floor PPF	
...	
OTHER PROPOSED REFERENCES	
Argument	Specification
Origin of the axis system	
Offsets and distances between axes	
Encoding axes or grids	
Units of measurement	
...	

### 15.11.5.2 Specification for inserting digital objects into models

Regardless of the format in which they will be originated and deposited, all graphic models must be developed by applying modeling criteria that allow their easy reading, querying and subsequent re-elaboration. In particular, in all cases where possible, the rules for a correct parameterization of the elements must be respected by introducing the appropriate geometric constraints. Each object shall be characterised so that at least the following basic information is legible or can be traced back to it:

- All objects inserted within the graphic model must be associated with the natural level of belonging (according to the specific discipline);
- All horizontal elements must be associated with the reference level in which they lie;
- All vertical elements (septa, pillars, etc.) must be modeled as discrete elements in their vertical development according to a subdivision that is consistent with the decomposition of WBS applied to the specific class of objects;
- All structural elements must be bound to the axes associated with them;
- All plant engineering machines must be associated with the reference level of the discipline / environment underlying them;
- All machines and plant engineering devices must be modeled with the exact position of the joints and passages (where provided for by the reference LOD) with respect to the real element.

### 15.11.5.3 Model encoding

The models developed for Risanamento Spa must follow the coding below.

CAMPO 1			CAMPO 2			CAMPO 3				CAMPO 4		CAMPO 5		
DISCIPLINA			FASE PROCESSO			FASE LOCALIZZAZIONE/LAVORAZIONE				DESCRIZIONE		N° PROGRESSIVO		
A	C	acustica	A	B	as built	1	*	*	*	MUdC "1"	abaco	0	0	1
A	R	architettura	B	D	brief design	21	*	*	*	MUdC "21"	collaudo	0	0	2
A	U	arredo urbano	C	L	collaudo	31	*	*	*	MUdC "31"	computo metrico	↓	↓	↓
B	N	bonifica	D	P	doc. indirizzo progettazione						contratto	9	9	9
G	E	geologia/geotecnica	E	S	esercizio	*	A	*	*	UdCP "A"	cronoprogramma			
I	E	impianti elettrici	P	C	progettazione costruttiva	*	B	*	*	UdCP "B"	elenco documenti			
I	I	impianti idrici	P	D	progettazione definitiva	↓	↓	↓	↓	↓	elenco lavorazioni			
I	M	impianti meccanici	P	E	progettazione esecutiva	*	M	*	*	UdCP "M"	elenco prezzi			
I	S	impianti speciali	P	F	progettazione fattibilità						modello			
I	N	infrastrutture	Q	E	quadro esigenziale	*	*	*	604	fondiarica 604	modello di flusso			
V	F	prevenzione incendi	R	E	realizzazione	*	*	*	V	fondiarie varie	particolari costruttivi			
S	C	sicurezza di cantiere			altre...						piano sicurezza cantiere			
S	S	sottoservizi				I	*	*	*	fase I	pianta			
S	T	strutturale				I	1	*	*	sottofase I.1	planimetria			
S	P	strutture prefabbricate				↓	↓	↓	↓	↓	profilo			
T	P	topografia				I	4	*	*	sottofase I.4	prospetto			
U	B	urbanistica									provvedimento			
V	R	verde				II	*	*	*	fase II	relazione			
V	I	viabilità				II	1	*	*	sottofase II.1	rendering/foto/video			
		altre....				II	2	*	*	sottofase II.2	sezione			
											stato avanzamento lavori			
						III	*	*	*	fase III	specifica tecnica			
						III	1	*	*	sottofase III.1	altre...			
						↓	↓	↓	↓	↓				
						III	4	*	*	sottofase III.4				
											altre...			

ESEMPIO DI DENOMINAZIONE FILE/MODELLO  
AR\_PD\_I14\*604\_Planimetria\_001  
ST\_PE\_21A\*604\_Cronoprogramma\_004

#### 15.11.5.4 Model attributes

The geometric attributes of graphic models related to design are shown in the following list:

- Address
- Coordinates
- Property
- Client
- Designers
- Other...

#### 15.11.6 Information structure of the documents

##### 15.11.6.1 Processing generation

All graphic drawings must be extrapolated from the model. For unmodeled parts, 2D parts linked to the model as described below must be made.

For non-graphic drawings (UNI 11337-1:2017) any data present therein and / or extrarailile must be extrapolated from the models without duplication.

##### 15.11.6.2 Processed encoding

The drawings developed for the design by Risanamento Spa follow the coding below.

...

#### 15.11.7 Object library information structure

##### 15.11.7.1 Object modelling rules

Describe how to make the objects to be included in the models.

### 15.11.7.2 *Encoding objects*

The objects developed for design by Risanamento Spa follow the coding below.

...

### 15.11.7.3 *Geometric attributes (LOG)*

All objects produced for design are characterized by a level of detail necessary and useful for the development phase of the project. By way of example, some possible information related to objects is shown in the table:

GEOMETRIC ATTRIBUTE
<ul style="list-style-type: none"> <li>• ...</li> <li>• ...</li> <li>• ...</li> </ul>

### 15.11.7.4 *Non-geometric attributes (LOIs)*

The non-geometric attributes related to the object are, for example, those referring to the technical characteristics of the object or to the correct maintenance and management. By way of example and not exhaustively, the following table shows some of the useful and necessary information for the different phases:

NON-GEOMETRIC ATTRIBUTE
<ul style="list-style-type: none"> <li>• ...</li> <li>• ...</li> <li>• ...</li> </ul>

### 15.11.7.5 *Libraries outside the organization*

Specify any external libraries used.

## 15.12 Exchange Information Requirements– EIR



**POLITECNICO**  
MILANO 1863

DIPARTIMENTO DI ARCHITETTURA,  
INGEGNERIA DELLE COSTRUZIONI  
E AMBIENTE COSTRUITO

TEMPLATE

# Exchange Information Requirements -EIR

Annex D



RISANAMENTO SpA

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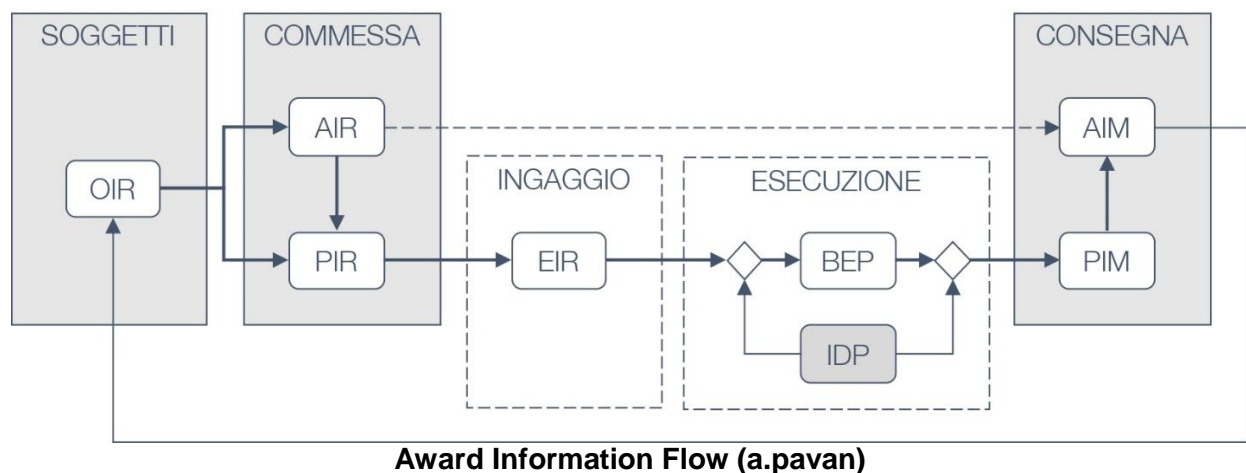
### 15.12.1 Introduction

### 15.12.2 Purpose

The main purpose of this document is to define the information exchange requirements between the Appointing party and the Appointed party/ parties (UNI EN ISO 19650-2:2018).

Therefore, in the paragraphs of which it is composed, the information requirements to be respected for the order in question will be specified, the level of information needs, the criteria for accepting each information requirement, the ancillary information and the (informative) deadlines established for this order.

The Information Specifications - CI, therefore, is prepared as a general guideline for the formulation of the Information Management offer (UNI EN ISO 19650/11337-5:2017), by the Competitors, and the subsequent Information Management Plan (UNI EN ISO 19650/11337-5:2017), by the Appointed party.



**Award Information Flow (a.pavan)**

The purpose of these Information Specifications – CI, therefore, is to define in a timely manner the needs and information requirements to which the competitor must respond and take into account (binding as contractual minimums) in the development of its Information Management offer - oGI and report / consolidate updated in its Information Management Plan - pGI, in case of award.

The Information Specifications - CI and the Information Management Plan - pGI constitute a minimum contractual obligation for the Appointed party.

### 15.12.3 Strategic information objectives of the IC

These Information Specifications – CI has the strategic information objective of optimizing the interoperability, transparency and adequacy of the data relating to the order in question.

In particular, this contract of ☐Lavori Servizi Forniture concerns ☐... write the subject of the contract...".

The activities covered by this contract are described in detail ☐in the Letter of Invitation to which this Information Specification is attached. ☐in the Call for Tenders and in the other contractual documents prepared by the Appointing party. ☐in the Request for Quotation and in the other contractual documents prepared by the Appointing party. ☐Other: "... specify the type of engagement...".

#### 15.12.3.1 2.2 Operational information objectives of the IC

In order to achieve the strategic information objectives described in the previous paragraph, it is intended to adopt "specific electronic methods and tools, such as those of modeling for construction

and infrastructure" (Legislative Decree 50/16, art. 23 and its implementing decrees), hereinafter also: "BIM methods and tools" (Building Information Modelling) and / or "information modeling", for the digital information management of contracts.

Therefore, for the purposes of the information flow of this contract, in addition to the reduction of legal and contract documentation, it will be mandatory positively considered the deposit on digital support and in the manner set out below of "multidimensional models, oriented to objects" (Legislative Decree 50/16, art. 23 and its implementing decrees), hereinafter also "graphic models" (UNI EN ISO 19650/11337-1: 2017), necessary for the fulfillment of the required information requirements.

### 15.12.3.2 Contractual prevalence

The Information Specifications - CI as well as the Information Management Plan - pGI are contractual documents.

The Information Specifications – CI is *binding* only for digital information topics, information processes, Hardware and Software digital tools, BIM information modeling (Building Information Model / Modelling) compared to other contractual documents.

The Information Specifications - CI has an *integrative character*, on purely informative topics, with respect to the other contractual documents.

In case of discrepancy, *primarily* the data and information present in the Letter of Invitation in the Announcement in the Request for Offer in the Request and of the other contractual documents, prevail over those of the Information Specifications - CI.

As a *secondary step* and with regard to data or information concerning only issues of an informative nature, these Information Specifications - CI and the related Information Management Plan - pGI prevail over any other tender and procurement document.

### 15.12.3.3 Identification of the contract

The general indications reported in the following table and referring to the order find their exhaustive explanation in all the documentation constituting the Letter of Invitation the Announcement the Request for Offer Other in question, to which reference is made for any definition of necessary detail.

<i>About the Appointing party</i>	
Appointing party	
Web address	
Call web page	
Protocol Office	
Protocol web page	
Protocol address	
Protocol telephone number	
Protocol e-mail delivery	
Responsible for the Procedure	
Telephone number RUP	
RUP e-mail address	
Works Manager	
Telephone number RL	
RL e-mail address	



<i>About the project</i>		
Project		
Category of Opera		
Type of Intervention		
Project Web Page		
Address of the Intervention		
Web page construction site		
Construction site telephone number		
E-mail address construction site		
...		
<i>Brief description of the Project</i>		
See:	Invitation letter	
	Needs framework	
	DIP	
	Feasibility Project	
	Final Project	
	Executive Project	
	Maintenance Plan	
	...	

#### 15.12.4 Technical Section

This section defines the minimum technical reference requirements for the systems to be used in the implementation of the contract with regard to Hardware, Software, data, reference systems, levels of development, skills, etc.

The indications concern, to varying degrees, both the Appointing party and the Appointed party.

##### 15.12.4.1 HW and SW infrastructure made available by the Appointing party

The following paragraphs specify the Hardware (HW) and Software (SW) that the Appointing party will make available for the specific order. Therefore, all the tools, digital and non-digital, provided by the Appointing party for the optimization of the order information flow are considered.

##### 15.12.4.2 Hardware Infrastructure

The following table shows the Hardware infrastructure made available for the order by the Appointing party.

<i>Hardware</i>		
<i>Nr.</i>	<i>Typology</i>	<i>Prevailing features</i>
	Server	Language HD
	...	...
	Network	LAN speed Wifi speed
	...	...
	Nas	...

NOTE: The information contained herein can be found in the Appointing party's OIL, AIL and/or PIL where present.

##### 15.12.4.3 Software Infrastructure

The following table shows the Software infrastructure made available for the order by the Appointing party.

<i>Software</i>				
<i>Utilization</i>	<i>Model</i>	<i>Brand</i>	<i>Version</i>	<i>N° Workstations</i>
<i>Sharing:</i>				
ACDat				
...				
<i>Generic:</i>				
Writing				
...				

NOTE: The information contained herein can be found in the Appointing party's OIL, AIL and/or PIL where present.

##### 15.12.4.4 Non-digital infrastructure

The following table shows the non-digital infrastructure made available for the contract by the Appointing party.

ACDoc			
Nr.	Typology	Location	
	Office, Archive...	City	
		Road	
		ZIP CODE	
		Building	
		Plan	
		Days	
		Times	
		ACDoc Contact Person	
		ACDoc Email	
		ACDoc Phone	
	...	...	

NOTE: The information contained herein can be found in the Appointing party's OIL, AIL and/or PIL where present.

#### 15.12.4.5 HW and SW infrastructure of the Contractor

The following paragraphs specify the Hardware (HW) and Software (SW) requested from the Appointed party and deemed necessary for the specific order.

The Appointed party will also be required to provide the technical specifications of the Hardware (HW) and Software (SW) infrastructures to be used to satisfy the information requirements set out in these Information Specifications - CI.

#### 15.12.4.6 Hardware Infrastructure Required

For the purposes of the information flows of this Contract and to support the activities described in these Information Specifications - CI, it is required that the Appointed party make available to the interested parties and to the Appointing party's himself an information infrastructure adequate to the correct functioning of the information flow.

☐ If no special Hardware (HD) infrastructure is required

Specifically, no specific hardware infrastructure is required for this Contract.

☐ If special Hardware (HD) infrastructures are required

Therefore, the following table shows the Hardware infrastructure specifically required for the order.

Hardware		
Nr.	Typology	Prevailing features
	Server	Language HD
	...	...
	Network	LAN speed Wifi speed
	...	...
	Nas	...

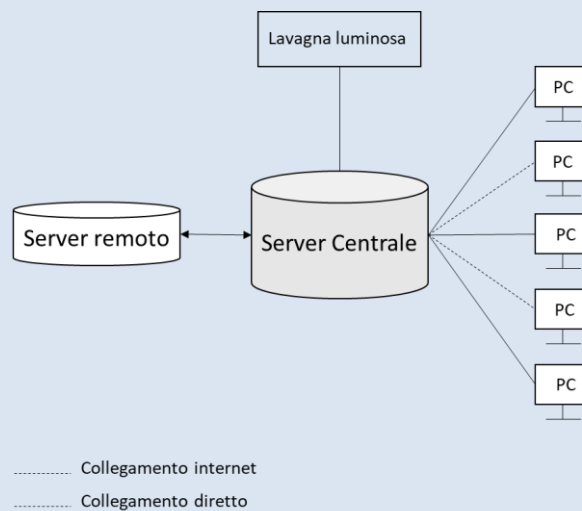
NOTE: The information contained herein can be found in the Appointing party's OIL, AIL and/or PIL where present.

In the Offer of Information Management - oGI, and consequently in the final Information Management Plan - pGI, it is requested that the Hardware infrastructure to be used in the performance of the Contract and the activities described in these Information Specifications - CI be explained.

The Hardware infrastructure already available and how much you specifically intend to use and / or integrate (purchase, rental, etc.) for this Contract must be indicated (specific integrations must be easily identifiable).

The above specification is equivalent to a declaration of availability and knowledge in the use (at an advanced professional level) of the infrastructure indicated, in the times and ways necessary for the use for this Contract.

The Hardware infrastructure and the related technical specifications must be summarized, by macro items, according to a graphic scheme and a tabular one to be reported in the IDP and consequently as part of the Information Management - oGI offer and the final information management plan - pGI, as indicated in the following examples:



**Example of Hardware Graphical Schema**

<i>Hardware</i>				
<i>Nr</i>	<i>Typology</i>	<i>Prevailing features</i>	<i>Present</i>	<i>Guaranteed</i>
	Server	Language HD	x	
	...	...		x
	Network	LAN speed Wifi speed	x	
	...	...		...
	Nas	...	...	

**Example of Hardware Tabular Schema**

**NOTE:** the information contained in the diagrams indicated above can be found in the OIL, AIL and / or PIL of the Appointed party where present and certainly present in the IDP of the same.

In the case of several interested parties (ATI, RTP, etc.) the infrastructure used by each subject and their interaction must be explained.

In the case of suppliers and subcontractors, even during the Contract, the same schemes must be produced in the supply and subcontracting request and attached to the original Information Management Plan - pGI.

#### 15.12.4.7 Software Required

For the purposes of the information flows of this Contract and to support the activities described in these Information Specifications - CI, it is required that the Appointed party make available to the interested parties and to the Appointing party himself an information infrastructure adequate to the correct functioning of the information flow.

☐ If no special Software Infrastructure (SW) is required

Specifically, no specific software infrastructure is required for this Contract.

☐ If special Software Infrastructures (SW) are required

Therefore, the following table shows the Software infrastructure specifically required for the order.

Software				
Utilization	Model	Brand	Version	N° Workstation.
<i>BIM authoring:</i>				
Architecture				
...				
Facilities				
...				
Mecc plants.				
...				
Plants elec.				
...				
<i>Verification:</i>				
Detec Clash.				
...				
Code Check.				
...				
<i>CAD:</i>				
Architecture				
...				
Facilities				
...				
Mecc plants.				
...				
Elec. plants				
...				
<i>Calculation:</i>				
Schedules				
...				
Structural calculation.				
...				
Calculation mecc.				
...				
Calculation elec.				
...				
<i>Generic tec:</i>				

Software				
Utilization	Model	Brand	Version	N° Workstation.
Illuminotec.				
...				
Eff. Energ.				
...				
Programmingz.				
...				
GIS				
...				
Generic:				
Writing				
...				

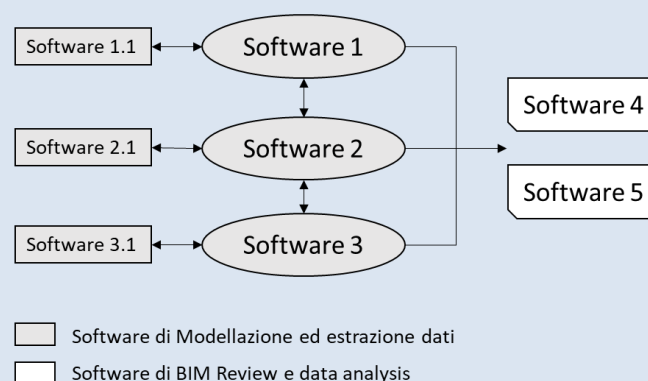
NOTE: The information contained herein can be found in the Appointing party's OIL, AIL where present.

In the Offer of Information Management - oGI, and consequently in the final Plan of Information Management - pGI, it is requested to make explicit the Software infrastructure that is intended to be used in the performance of the Contract and the activities described in these Information Specifications - CI.

The software infrastructure already in use and the one that is specifically intended to be used and / or integrated (purchase, rental, etc.) for this Contract must be indicated (specific integrations must be easily identifiable).

The above specification is equivalent to a declaration of availability and knowledge in the use (at an advanced professional level) of the infrastructure indicated, in the times and ways necessary for the use for this contract.

The Software infrastructure and the related technical specifications must be summarized, by macro items, according to a graphic scheme and a tabular one to be reported in the IDP and consequently as part of the Information Management - oGI offer and the final information management plan - pGI, as indicated in the following examples:



**Example Graphic Diagram Software**

Software						
Utilization	Model	Brand	Version	N° Workstations	Present	Guaranteed

Software						
Utilization	Model	Brand	Version	N° Workstations	Present	Guaranteed
<i>BIM authoring:</i>						
Architecture					X	
...						
Facilities						X
...						
Mecc plants.					X	
...						
Plants el.						...
...						
<i>Verification:</i>						
Clash Detection					X	
...						
Code Check.					X	
...						
<i>CAD:</i>						
Architecture					...	
...						
Facilities						...
...						
Mecc plants.					...	
...						
Plants and readers.					...	
...						
<i>Calculation:</i>						
Schedules						
...						
Structural calculation.						
...						
Calculation mecc.						
...						
Electronic calculation						
...						
<i>Generic tec:</i>						
Illuminotec.						
...						
Eff. Energ.						
...						
Programmingz.						
...						
GIS						
...						
<i>Generic:</i>						
Writing						
...						

<b>Software</b>						
<i>Utilization</i>	<i>Model</i>	<i>Brand</i>	<i>Version</i>	<i>N° Workstations</i>	<i>Present</i>	<i>Guaranteed</i>

### Example Tabular Diagram Software

NOTE: the information contained in the diagrams indicated above can be found in the OIL, AIL where present.

In the case of several interested parties (ATI, RTP, etc.) the infrastructure used by each subject and their interaction must be explained.

In the case of suppliers and subcontractors, even during the Contract, the same schemes must be produced in the supply and subcontracting request and attached to the original Information Management Plan - pGI.

#### 15.12.4.8 Information management skills

In the Offer of Information Management - oGI, and consequently in the final Information Management Plan - pGI, the non-binding listing of any previous direct experience, considered significant with respect ☐ to the Letter of Invitation to the Call for Tenders Other ☐ in question, in terms of the use of processes and methods of digital information management "BIM", is required.

Therefore, by way of example and not exhaustive, a standard table is reported to be considered in the explanation of one's previous information management skills.

<b>PREVIOUS INFORMATION EXPERIENCE:</b>		<b>n°</b>
<i>Name of the work/contract:</i>		
<i>Appointing party:</i>		
Category of intervention (ref. DL50/2016)		
Type of intervention (ref. DL50/2016)		
Localization of the intervention		
Amount of invitation to tender for assistance*	€	discount: ____ %
Modeling and information management activities**		
of which carried out/entrusted directly**		
Brief description of the activity		
Tender amount of the activity* information	€	discount: ____ %
Statement by the Appointing party	Annex No.	X

(\*) The values are expressed gross of the discount subsequently applied (to be explained separately as a percentage)

(\*\*) Describe the modelling and information management activities applied to the contract and, in particular, their specific contribution

#### 15.12.4.9 Data formats made available by the Appointing party

Each file made available by the Appointing party will be provided, where possible, in an open and interoperable format.

Any graphic models made available will have a purely indicative character and must in any case be verified according to the surveys on the places.



#### 15.12.4.10 Supply and exchange of data

For the purposes of data exchange and storage, the files must be provided to the Appointing party in the open format (Legislative Decree 50/16, art. 23 and its implementing decrees) and, where specified, in the open format required in the following paragraphs.

In case of disputes, it is the right of the Appointing party to request the production of the original files in native format (even if proprietary).

☐ If ACDat made available to the Commissioner

In the case of ACDat requested by the Appointed party (see paragraph "Software Infrastructure required"), for the purpose of ensuring the reading, management and storage of data over time, the Appointed party himself at the end of the Contract must provide a specific report on the architecture, language, structure, etc. of the DB used on which the Sharing Environment is built.

#### 15.12.4.11 Contraction phase

All digital documents and models made available by the Appointing party will be provided in open format (mainly in pdf, rtf, IFC, xml, etc.).

The digital copies of models and works made available by the Appointing party (announcement, attachments, etc.) will be visible and / or downloaded electronically at the following web address:

- [http/... enter web address...](#)

Any hard copies of the same, where possible the extraction, will be available:

- for the acknowledgment, in the ACDoc of the Appointing party (see paragraph "Non-digital infrastructure");
- for the withdrawal, upon request and payment of the out-of-pocket reproduction costs and rights, at: ... enter address... ; e-mail: ... enter mail... ; telephone: ... enter phone number... ; timetable: ... enter time for pick-up... .

On request, for the sole purpose of drafting the offers and without prejudice to the contractual prevalence of the aforementioned open formats, the following models and digital elaborations may be requested (and will be provided in digital copy) also in native format:

<i>Typology</i>	<i>Name</i>	<i>Format</i>
Model:	Detected by point cloud	
	MEP Systems	
	Facilities	
Drawing:	Point Cloud	
	Metric computation	
	Price analysis	
	...	

#### 15.12.4.12 Contraction phase

All digital documents and models produced by the Appointing party will be provided in open format (mainly pdf, rtf, IFC, xml) and made available to the Appointed party in the Publication space (UNI EN ISO 19650-1) of the General ACDat of the Contract.

However, the contractual prevalence of the paper copy (or digital in open PDF format with Digital Signature) of the aforementioned works or of the extractions / views of the models is reserved.

#### 15.12.4.13 Required file formats

The open formats required, and permitted, by this Contract for digital models and drawings are as follows:

<i>Typology</i>	<i>Required Format</i>	<i>Note</i>
Graphic Templates	IFC 2.3; IFC 4.0; LAND XML	
Graphic elaborations	PDF, DXF	
Interference Analysis Reports	PDF	
Inconsistency Analysis Reports	PDF	
Calculation papers	PDF	
Text papers	PDF, RFT	
Programming papers	PDF, XML	
Presentation papers	PDF	
Point Cloud		
Imagery	TYPO	
...	...	

The file formats requested by the Appointing party must be confirmed and possibly implemented with additional additional open formats, according to a tabular scheme to be reported in the IDP and consequently as part of the Information Management offer - oGI and the final information management plan - pGI, justifying the advantages for the Contract and the Appointing party in the notes, as indicated in the following example:

<i>Typology</i>	<i>Format</i>		<i>Note</i>
	<i>Required (*)</i>	<i>Proposed (**)</i>	
Graphic Templates	IFC 2.3; IFC 4.0; LAND XML		
Graphic elaborations	PDF, DXF		
Interference Analysis Reports	PDF		
Inconsistency Analysis Reports	PDF		
Calculation papers	PDF		
Text papers	PDF, RFT		
Programming papers	PDF, XML		
Presentation papers	PDF		
Point Cloud			
Images	TIF		
...	...		

(\*) request of the Client/Contracting Authority, minimum contract

(\*\*) proposal of the successful tenderer, additional to the (minimum) request of the Principal

#### 15.12.4.14 File size

The individual models developed by the Appointed party may have a maximum size of ... enter maximum size... Mb per single file.

Therefore, the Appointed party will have to integrate the articulation of the structure of the models in such a way as to respect the dimensional limits imposed here (decomposition of areas, buildings, etc.).

Specific information needs that may be limited by the size of the files imposed above must be explained according to a tabular scheme to be reported in the IDP and consequently as part of the Offer of Information Management - oGI and the final information management plan - pGI, appropriately justified in the notes and with the right of the Appointing party to accept or reject them according to the real need and solidity of the justifications themselves, as presented in the following example:

Typology	Dimension		Note
	Required (*)	Proposed (**)	
Model			
...			

(\*) request of the Proposed, minimum contract

(\*\*) proposal of the Commissioner, additional to the (minimum) request of the Appointing party

#### 15.12.4.15 Information specifications for interoperability

In order to ensure the completeness of data and attributes in the graphic models provided in open format and their interoperability with other models or drawings, the Appointed party in the Offer of Information Management - oGI, and consequently in the final Plan of Information Management - pGI, must specify in addition to the version of the .ifc format (as well as in the table in the paragraph "Required file formats"), also the chosen Model View Definition (MVD) and any other property sets (IFC property set; IFC proxy) justifying the advantages for the specific intervention and for the Appointing party. In general, the MVD "Coordination View – CV 2.0" is preferred, guaranteeing, in addition, the inclusion of all the fundamental geometric parameters and the required information, as reported by way of example and not exhaustive in the following table:

<i>Element type</i>	<i>IFC Class</i>	<i>Required property sets</i>	<i>LOD</i>
<i>Example: Masonry</i>	<i>IfcWall</i>	<i>Project coding Object Encoding Price list encoding WBS encoding</i>	<i>Everybody Everybody Everybody Everybody</i>
...	...	...	...

In addition, depending on the specific software used for the development of information models, it is requested to specify any variations with respect to the association of native elements to IFC classes and with respect to the addition of additional information fields according to the tabular scheme proposed below.

All the information attributes requested by the Appointing party and / or declared by the Appointed party in the paragraphs:

- System of coding and naming of objects,
- LOIN,
- Defining how to resolve interference and inconsistencies

they must be present in the models filed in open format.

In the event of a request for the proprietary formats of the models, the Appointed party will verify the congruence of the information attributes present in the objects of the latter with the mandatory ones in open format.

#### 15.12.4.16 Common coordinate system and reference specifications

Objects and graphic models must have a single common reference system.

For any other data, or information, for which its georeferencing is significant (regardless of the model or process that contains it) you must still refer to the common coordinates.

<i>Absolute reference system</i>	
<i>Argument</i>	<i>Specification</i>
Intersection grids XX and YY	
Altimetry	
Rotation according to the real north	
Ground floor PPF	
...	
<i>Other references of the Appointing party</i>	
<i>Argument</i>	<i>Specification</i>
Origin of the axis system	
Offsets and distances between axes	

Encoding axes or grids	
Units of measurement	
...	

In the Offer of Information Management - oGI, and consequently in the final Plan of Information Management - pGI, any other reference systems that are considered useful for the specific contract may be proposed by filling in the table below.

<i>Other proposed references (oGI and pGI)</i>	
<i>Argument</i>	<i>Specification</i>
...	...
...	...

#### 15.12.4.17 Process step system

*Insert within the paragraph the system of phases of the process adopted.*

#### 15.12.4.18 File encoding and naming system

☐ If NOT in possession of an encoding

In the Information Management - oGI offer, and consequently in the final Information Management Plan - pGI, the single reference system for the classification and naming of the files delivered must be defined, together with the criteria that will be applied for the management of the system itself within this Contract.

By way of example, but not limited to, there are some classification and naming standards that can be used:

- BS 1192:2007+A2:2016;
- UNI EN ISO 19650/11337-6:2017

In the case of proprietary or mixed systems, the Offer of Information Management - oGI, and consequently the final Information Management Plan - pGI, must be accompanied by a specific Annex containing the guide to the interpretation and use of the coding system used (structure, areas of application, limits of use, translation into Italian - if in another language, etc.; Annex "X": Structure of the proposed file classification system).

☐ If you have an encoding

The name of the files will follow the encoding as follows:

*... write the encoding of the files. If necessary, prepare a reference annex or refer to the paragraph prepared in the Project Information Guidelines – PIL (if in possession) ...*

The Appointed party, in case of need, may propose any additions to the structure described.

#### 15.12.4.19 Coding and naming system of objects

☐ If NOT in possession of an encoding

In the Offer of Information Management - oGI, and consequently in the final Information Management Plan - pGI, the single reference system for the classification and naming of digital objects, graphic models, together with the criteria that will be applied for the management of the system itself within this Contract, must be defined.

By way of example, but not limited to, there are some classification and naming standards that can be used:

- UNI 8290-1:1981;
- OMNICLASS (latest version available; ref.: <http://www.omniclass.org>);
- UNICLASS (latest version available; ref.: <https://toolkit.thenbs.com/articles/classification/>);
- UNIFORMAT (latest version available; ref.: <https://www.nist.gov>);
- PC-SfB (latest version available; ref.: DIP. DIPE, La sapienza – Rome, ITEC – Milan; 1983).

In the case of proprietary or mixed systems, the Offer of Information Management - oGI, and consequently the final Information Management Plan - pGI, must be accompanied by a specific Annex containing the guide to the interpretation and use of the coding system used (structure, areas of application, limits of use, translation into Italian - if in another language, etc.; Annex "X": Structure of the proposed digital object classification system).

For the purposes of completeness of information, a correlation document is required of the classification system of the digital objects of the graphic models with any other classification and naming system used for the elements contained in other models or elaborations of the Contract and, in any case, mandatorily, with the classification and naming systems used to define the elements contained in:

- abacus;
- descriptive and performance specifications;
- price lists;
- metric calculations;
- WBS.

NOTE: The combination could be one to one, one to many, many to one, etc. indifferently. Each proposed reference system will have to take into account the compliance with the systems already used for the previous phase/stage.

Therefore, by way of example and not exhaustively, the following table shows the structure of correlation work of coding systems. The paper must be delivered in both open (PDF, XML) and native structured digital format.

<b>Object:</b>	<b>CODING</b>						
	<i>Model</i>	<i>Price list</i>	<i>WBS</i>	<i>CPV</i>	<i>Specifications</i>	<i>Descriptive specifications</i>	<i>International (e.g. Omniclass)</i>
Masonry	xx.xx.	xx.yy	yy.zz	Zz	kk.xxx.vv	000.vv	yy.00.ss
..	...	...	...	...	...	...	...

☐ If you have an encoding

The encoding and naming of the objects will follow the encoding as follows:

*... write the encoding of objects. If necessary, prepare a Reference Annex or refer to the prepared paragraph of the Project Information Guidelines – GDP (if in possession) ...*

The Appointed party, in case of need, may propose any additions to the structure described.

**15.12.4.20 3.9 LOIN definition system**

*Insert within the paragraph the system of definition of the LOIN adopted.*

### 15.12.5 Management Section

This section defines the minimum management requirements of reference in the implementation of the contract in terms of uses and objectives of models, information needs, coordination, identification of roles and responsibilities as well as the methods and timing of delivery.

The indications concern, to varying degrees, both the Appointing party and the Appointed party.

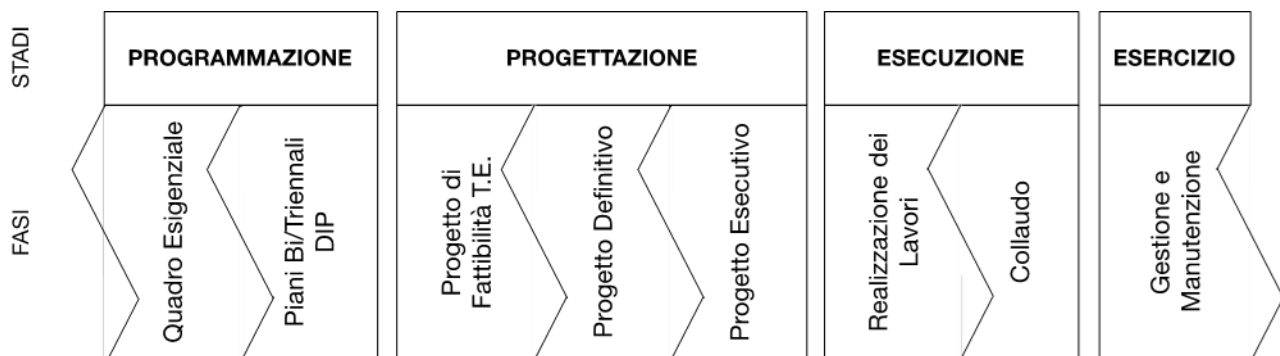
#### 15.12.5.1 Objectives and information uses

Without prejudice to any qualitative and quantitative constraints referring to the legal services due by the Appointed party for the type of contract in question, the models and the documents must also guarantee a quantity and quality of information sufficient to ensure:

- compliance with the objectives of the process phase to which they refer;
- compliance with the (specific) objectives envisaged and required in these Information Specifications - CI in the following paragraphs;
- the (specific) uses envisaged and requested in these Information Specifications - CI in the following paragraphs.

#### 15.12.5.2 Phase objectives

These Information Specifications - CI refers to the following phase(s) of the process as defined/defined in Legislative Decree 50/16, art. 23 and its implementing decrees.



**Phases of the Process according to the Italian Legislative Decree 50/2016**

<i>Programming</i>	
Requirements	
Two-year program of services and supplies	
Three-year work programme	
Economic Framework	
Design Policy Document (DIP)	
<i>Design</i>	
Investigations and surveys	
Technical and Economic Feasibility Project	
Feasibility document of design alternatives	
Final Project	
Executive Project	
Design verification	
<i>Execution</i>	
Realization of the works	



Test	
<i>Exercise</i>	
Management	
Maintenance	

Therefore, the phase objective of the contract in question is expressed in the following table:

<i>Stage</i>	<i>Phase</i>	<i>Phase objective</i>
...	...	...

*NOTE: the information contained herein can be found in the OIL, AIL and / or PIL of the Appointing party where present or more generally in the o UNI EN ISO 19650/11337-5: 2017.*

In the Offer of Information Management - oGI and consequently in the final Information Management Plan - pGI, any additional objectives useful for improving the transparency, congruence and information management of this Contract may be proposed, by filling in the table below.

<i>Stage</i>	<i>Phase</i>	<i>Phase objective</i>
...	...	...

### 15.12.5.3 Objectives of models and elaborations

Without prejudice to any legal constraints and requirements, in relation to the phases considered, the minimum reference models for the aforementioned phase and their objectives are defined as follows.

<i>Stage</i>	<i>Phase</i>	<i>Model</i>	<i>Objective of the model</i>

*NOTE: the information contained herein can be found in the OIL, AIL of the Appointing party where present or more generally in the o UNI EN ISO 19650/11337-5: 2017.*

In the Information Management - oGI offer and in the final Information Management plan - pGI, the proposed structuring of the graphic models that will be produced for the following Contract must be explained and any further useful objectives may be proposed in a tabular scheme such as the one shown below, in order to improve the transparency, congruence and information management of this Contract.

<i>Stage</i>	<i>Phase</i>	<i>Model</i>	<i>Objective of the model</i>

The graphic models can be divided, for example, according to the disciplinary areas and the various disciplines concerned (UNI EN ISO 19650/11337-1: 2017). Type, quantity and quality of the models and their subdivision must be modulated according to the current legislation, the phases, objectives and uses of the models required in these Information Specifications - CI.

An illustrative and non-exhaustive scheme of structuring and subdivision of graphic models is used both as "survey models" and as "project models" (UNI EN ISO 19650/11337-1:2017):

- GIS graphic models – survey and/or project
  - Territorial (environmental, geological, etc.);
  - Cadastral;
  - Toponymy;
  - Urban planning;
  - Constraints;
  - Other...
- Bim Authoring graphic models – relevant and/or project
  - Site/grounds;
  - Urban planning;
  - Constraints (historical, artistic, environmental, servitude, etc.);
  - Urbanization;
  - Architectural (building);
  - Finishes;
  - Facades;
  - Structures;
  - Mechanical plant engineering;
  - Water systems;
  - Electrical systems;
  - Security;
  - Fire prevention;
  - Energetic;
  - Acoustic;
  - Maintenance;
  - Disposal;
  - Other...

The subdivision can also be by zones, by location (network systems), by buildings, by levels (underground plate, above-ground development, etc.), and more.

#### 15.12.5.4 Uses of models and elaborations

For illustrative and non-exhaustive purposes only, without prejudice to any legal constraint and prescription in relation to the phases considered, it is required that the models and the drawings can guarantee at least the minimum uses described below:

<i>Stadio</i>	<i>Phase</i>	<i>Model</i>	<i>Using the Template</i>

<i>Stadio</i>	<i>Phase</i>	<i>Drawing</i>	<i>Use of the paper</i>

**NOTE:** the information contained herein can be found in the OIL, AIL and / or PIL of the Appointing party where present or more generally in the o UNI EN ISO 19650/11337-5: 2017.

In the Offer of Information Management - oGI and consequently in the final information management plan - pGI, any further uses that are expected to be useful may be proposed, in a tabular scheme such as the one shown below, for the purpose of improving the transparency, congruence and information management of this Contract.

<i>Stadio</i>	<i>Phase</i>	<i>Model</i>	<i>Using the Template</i>

<i>Stadio</i>	<i>Phase</i>	<i>Drawing</i>	<i>Use of the paper</i>

#### 15.12.5.5 **Information content**

The following paragraphs contain the supporting information provided for this Contract and the indications on the minimum information content to be delivered at the end of the activities planned and described in the Information Specifications - CI.

#### 15.12.5.6 **Information content provided by the Appointing party**

They are ☐ listed below in Annex "...". Other ☐ files made available by the Appointing party for this Contract.

#### 15.12.5.7 **Minimum information content required**

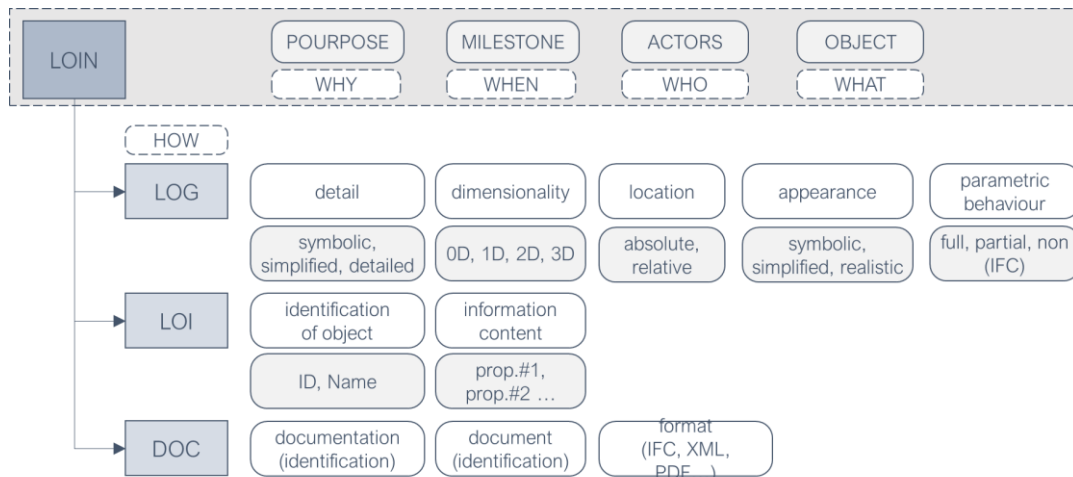
Without prejudice to any legislative reference due to the nature and type of work and intervention, the minimum production of the graphic drawings (two-dimensional) is required, directly extrapolated or linked to the models reproducible on paper or digitally (PDF) at a scale appropriate to the level of the process phase, as reported ☐ in the following list in Annex "...". Other ☐.

*NOTE: the information contained herein can be found in the PIR of the Appointing party where present.*

In the Offer of Information Management - oGI and consequently in the final information management plan - pGI, any additional objectives useful for improving the transparency, congruence and information management of this Contract may be proposed.

#### 15.12.5.8 **LOIN**

The level of information required - LOIN (UNI EN ISO 19650) required from the Appointed party (Plaintiff) for the Contract in question (Object), is defined in accordance with the requirements of Legislative Decree 50/2016 and subsequent amendments for the phases covered by the Contract (Purpose), according to the filing times established ☐ in the Letter of Invitation in the Call in the Request for ☐ Quotation in the Request ☐ (Milestone of deliveries).



### prEN17491 – UNI EN ISO 19650 (a.pavan)

The LOIN will also have to meet the achievement of the phase objectives and the objectives and uses of the models identified in the previous paragraphs. In addition, it must be specified (prEN 17412):

- The purpose for the use of the information to be provided;
- Information delivery milestones;
- The actors who will request and provide the information;
- Objects in one or more decomposition structures;

as better defined in the following paragraphs.

#### 15.12.5.8.1 LOD

The Levels Of Development (LEVEL Of Development) – LOD chosen for each discipline and for each object of each graphic model are designed to guarantee the minimum legal constraints in force, in addition to the phase objectives and the objectives and uses of the models described in these Information Specifications - CI.

<i>Phase</i>	<i>Model</i>	<i>LOD Required</i>	<i>Note</i>

In the Information Management offer - oGI, and consequently in the final Information Management plan - pGI, different LODs must be confirmed or proposed, filling in the tabular scheme below, justifying the advantages for the Contract and the Appointing party in the notes.

<i>Phase</i>	<i>Model</i>	<i>LOD</i>		<i>Note</i>
		<i>Required (*)</i>	<i>Proposed (**)</i>	

(\*) request of the Appointing party, minimum contract

(\*\*) proposal of the Commissioner, additional to the (minimum) request of the Appointing party

It is also requested to define a summary synthesis matrix of the minimum (M) and prevailing (P) level of development of LOD, distinguished by phase and by model, as reported in the following example and not exhaustive general scheme.

	STAGES													
	PROGRAMMING		PROG. FEASIBILITY		PROG. DEFINITIVE		PROG. EXECUTIVE		REALIZATION		TESTING/AS-BUID		EXERCISE	
MODEL	Minimum/Prevalent LOD OBJECTS													
	M	P	M	P	M	P	M	P	M	P	M	P	M	P
RELIEF:														
ARTISTIC HISTORY:														
TERRITORIAL:														
URBAN:														
URBANIZATIONS:														
SITE:														
ARCHITECTURAL:														
FINISHES:														
CURTAIN:														
FACILITIES:														
ELECTRICAL:														
MECHANICAL SYSTEMS:														
HYDRO-SANITARY SYSTEM:														
AIR CONDITIONING SYSTEM:														
ANTIFIRE:														
ENERGETIC:														
ACOUSTIC:														
SAFETY:														
....														

By confirming the proposed LOD, the Appointed party assumes responsibility for the adequate compliance of the LODs with the minimum legal constraints in force, in addition to the phase objectives and the objectives and uses of the models described in these Information Specifications - CI.

The LOD responding to the legal constraints, the phase, the objectives and the defined uses, as well as the significance of the possible interferences or inconsistencies to be analyzed or verified (UNI EN ISO 19650/11337-5: 2017) will determine:

- the degree of modeling needed;

- the degree of possible integration through drawings (2D drawings, texts, images, etc.);
- the quantity, quality and robustness (decision-making degree) of the necessary data and attributes.

These last indications will be specified in a dedicated annex (Annex "XX": Structure of the LODs). In order to ensure the correct reading and interpretation of the data, a special summary table must be prepared in support of the annex in which, for each information field included in the model and in the objects contained therein, the information necessary to eliminate possible ambiguities must be made explicit. Given the possible presence of predefined information fields within the specific modeling software used and not eliminable and / or alterable, it must be clearly specified which data provided are to be considered effective and which are not.

Therefore, by way of example and not exhaustive, a possible tabular scheme showing the indications reported is reported:

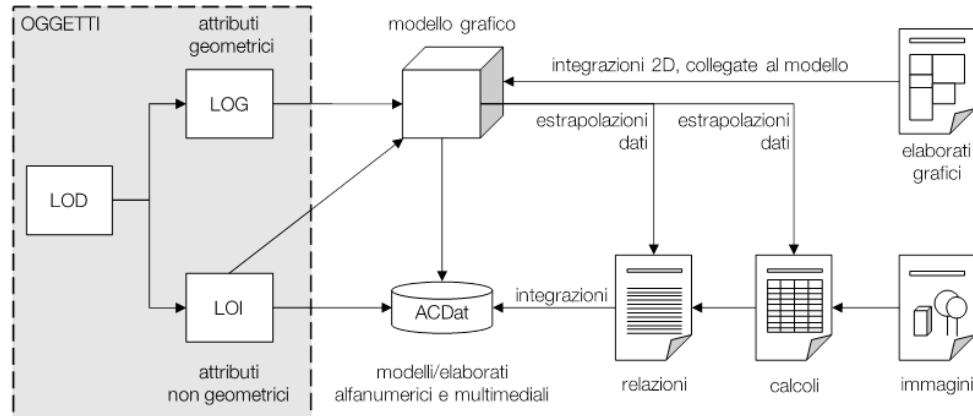
<i>Class Information</i>	<i>Information field</i>	<i>Origin (ST/PR*)</i>	<i>Function</i>	<i>U.M. **</i>	<i>Good (YES/NO)</i>
<i>Model</i>	<i>Modeller</i>	<i>PR</i>	<i>Identify the responsible modeler</i>	-	YES
	<i>Project Status</i>	<i>ST</i>	<i>Identifies project status according to Contractor's internal specifications</i>	-	YES
	....	...	...	...	...
<i>Walls</i>	<i>Absorption</i>	<i>ST</i>	-	-	NO
	<i>Coding</i>	<i>PR</i>	<i>Identifies the identification code in compliance with the classification indicated in the pGI</i>	-	YES
	...	...	...	...	...
<i>Materials</i>	<i>Density</i>	<i>ST</i>	<i>Identify the density of the material</i>	<i>Kg/m3</i>	YES
	<i>Description</i>	<i>ST</i>	<i>Identify the synthetic description of the material</i>	-	YES
	....	...	...	...	...
...	...	...	...	...	...

\* ST- standard: default parameter in modeling software; PR-owner: parameter inserted as user customization

\*\* U.M. : Units of measurement

The LODs thus defined must in any case guarantee the completeness and congruence of the information through the use of graphic and non-graphic attributes connected / related to each other: object-model /drawings -ACDat.

By way of example, see the following outline of principle:



**Scheme of the LOD. Geometric and non-geometric information attributes (a.pavan)**

#### 15.12.5.8.2 LOG

The Information Level of the Geometries - LOG must be taken from the LOD defined in the previous paragraph and currently in common use (UNI EN ISO 19650/11337-4).

#### 15.12.5.8.3 LOI

The Information Level - LOI must be taken from the LODs defined in the previous paragraph and currently in common use (UNI EN ISO 19650/11337-4).

#### 15.12.5.8.4 DOC

The Information Level of the Documents – DOC to be produced by the Appointed party, for the phases covered by the contract and as the minimum level for this Contract, is defined by Legislative Decree 50/2016 and subsequent amendments. and DM 143/13 (table Z2 performance and parameters).

### 15.12.5.9 Roles, responsibilities and authorities for information purposes

For the purpose of ensuring collaboration between the interested parties and the efficiency and effectiveness of the information flow of the Appointed party, the following paragraphs identify the figures, roles and authority for the purpose of informing the Appointing party.

In the Offer of Information Management - oGI, and consequently in the final Information Management Plan - pGI, the figures, roles and authority for the information purposes of the Appointed party must be specified in the same way.

### 15.12.5.10 Organigram of the Appointing party

The information structure of the Appointing party for this Contract, without prejudice to the reference functions referred to in UNI EN ISO 19650/11337-7 is structured as follows:

... Report the organization chart established for the order, available in the Project Information Guidelines – GDP where present ...

The information flow of the Appointing party for this Contract, therefore, is structured as follows according to the roles used:

... Report the flow established for the order, available in the Project Information Guidelines – GDP where present ...

In the Offer of Information Management - oGI, and consequently in the final Information Management Plan - pGI, in addition to the identification of the organization chart of the Appointed party, it must be



specified how it is intended to integrate into the process the coordination and verification activities required in the paragraph "Information coordination" and which will be the figures who will deal with it.

Example of organizational chart:

...

Example of information flow:

...

#### 15.12.5.11 Registry of subjects

Due to the information roles identified in the previous paragraph, the references of the relative figures of the Appointing party are reported.

... Report the personal data of the subjects available in the Project Information Guidelines – PIL where present...

In the Offer of Information Management - oGI, and consequently in the final Information Management Plan - pGI, the references of the figures involved in the information process of each organization involved must be explained, in line with the roles identified in the previous paragraph.

We report, therefore, an illustrative and non-exhaustive table on the personal data of the figures:

<b>Organization A</b>		...					
<b>Figure</b>		<b>Company role</b>	<b>Information role</b>	<b>Email</b>		<b>Tel.</b>	<b>Mob.</b>
<b>Name</b>	<b>Surname</b>			<b>corporate</b>	<b>certified</b>		
			Gest. Info. Appointing party				
			Gest. ACDat				
			Gest. Contract Info				
			Coord. Info.				

#### 15.12.5.12 Matrix of information responsibilities

Due to the information roles identified in the previous paragraph, the matrix of the Information Responsibilities of the Appointing party is reported.

... Report matrix of information responsibilities available in the Project Information Guidelines – PIL where present...

In the Offer of Information Management - oGI, and consequently in the final Information Management Plan - pGI, the matrix of responsibilities for the contract in question must be defined, in line with what was declared in the previous paragraphs.

Example of a responsibilities matrix:

...



**15.12.5.13 Information references of the Appointing party (OIL)**

The Information Management Manual - OIL will be made available to the bidder within the AcDOC, which defines the information references of the Proponete.

Specifically, upon request and with adequate justification, you can take a look at the following annexes:

A. Organization Information Guidelines (OIL)

A1. Organization Information Requirements (OIR)

A2. Organization Information Maps (OIM)

B. Asset Information Guidelines (AIL)

B1. Asset Information Requirements (AIR)

B2. Asset Information Models (AIM)

C. Project Information Guidelines (PIL)

C1. Project Information Requirements (PIR)

C2. Project Information Model (PIM)

D. BIM Execution Plan (BEP)

E Platform Data Management (PDM)

E1. Common Data Environment (CDE)

E2. Data Room (DR)

**15.12.5.14 Structure and organization of information content**

The following paragraphs focus on the analysis and explication of the structure and organization of information content. Therefore, starting from the structure of the disciplinary models that will be described in the Offer of Information Management - oGI and in the final Plan of Information Management - pGI (see paragraph *Objectives of models and drawings*) the following must be specified.

**15.12.5.15 Structure of information content**

In the Information Management offer - oGI and in the final Information Management Plan - pGI, the tree structure of the information contents in reference to this Contract must be specified.

Example of an information content tree structure:

...

**15.12.5.16 Object tree structure**

In the Information Management offer - oGI and in the final Information Management Plan - pGI, the tree structure of the objects in reference to this Contract must be specified.

Example of an object tree:

...

**15.12.5.17 Specifications for inserting objects**

Regardless of the format with which they will be originated and deposited, all graphic models must be developed by applying modeling criteria that allow their easy reading, interrogation and subsequent re-elaboration.

In particular, in all cases where possible, the rules for a correct parameterization of the elements must be respected by introducing the appropriate geometric constraints. By way of example and not exhaustively, some reference rules are reported so that the following basic information can be readable and traceable to the object:

☐ Territorial

- All the points inserted inside the model must report the investigated stratigraphy;
- Other.

☐ Infrastructure

- All objects inserted within the graphic model must be associated with the natural level of belonging (according to the specific discipline);
- All horizontal elements must be associated with the reference level in which they lie;
- All vertical elements (septa, pillars, etc.) must be modeled as discrete elements in their vertical development according to a subdivision that is consistent with the decomposition of WBS applied to the specific class of objects;
- All structural elements must be bound to the axes associated with them;
- All plant engineering machines must be associated with the reference level of the discipline / environment underlying them;
- Other.

☐ Buildings

- All objects inserted within the graphic model must be associated with the natural level of belonging;
- All the finishing layers of the floors placed on the intrados and the false ceilings must be associated with the level / environment below them;
- All horizontal elements, except for the roofs and finishing layers as identified above, will have to be associated with the reference level in which they lie;
- All vertical elements (walls, pillars, etc.) must be modeled as discrete elements in their vertical development according to a subdivision that is consistent with the decomposition of WBS applied to the specific class of objects;
- All structural elements must be bound to the axes associated with them;
- All plant engineering machines positioned on the ceiling must be associated with the reference level of the discipline / environment underlying them;
- All machines and plant engineering devices must be modeled with the exact position of the joints (where provided for by the LOIN) with respect to the real element.
- Other.

☐ Refer to the Project Information Model – PIM (if in possession)

In the Information Management offer - oGI and consequently in the final Information Management plan - pGI any further specifications for the insertion of the objects may be proposed, justifying the advantages for the Contract and the Appointing party.

### **15.12.5.18 Extrapolation of drawings from models**

In the Offer of Information Management - oGI and consequently in the final Information Management Plan - pGI must be explained the documents directly extrapolated from the graphic models or directly connected to them. What is declared must be consistent with Legislative Decree 50/2016 and subsequent amendments and Ministerial Decree 143/13 (Table Z2 performance and parameters) and the requests and declarations made explicit in these Information Specifications - CI.

By way of example and not exhaustive, a reference table is given:

<i>Model</i>	<i>Code</i>	<i>Drawing</i>	<i>Code</i>	
...				
<i>architectural</i>	<i>xx.xx</i>	<i>ground floor plan</i>	<i>xx.xx.xxx</i>	<i>and</i>
	<i>xx.xy</i>	<i>first floor plan</i>	<i>xx.xx.xxy</i>	<i>and</i>
	...	...	...	
	<i>zz.zz</i>	<i>metric calculation of architectural works</i>	<i>xx.xx.xxZ</i>	<i>and</i>
		<i>architectural works</i>	<i>xx.xx.xxk</i>	<i>c</i>
	...	...	...	
...				
<i>legend</i>				
	<i>e</i>	<i>drawing extrapolated from model</i>		
	<i>c</i>	<i>drawing related to the model</i>		

#### 15.12.5.19 Temporal planning of information content

In the Offer of Information Management - oGI and consequently in the final Information Management plan - pGI the time schedule envisaged for modeling and the general information process (information schedule) must be explained in relation to the planning of the work phases (work schedule).

A tree structure of the information and modeling activities (Work Breakdown Structure - WBS) must be defined, which also includes the iterations with the Appointing party and any other legal entity interested in this Contract in the same phase of the process analyzed.

The activities, dependencies and temporalities must also be explained in graphic form through Gantt charts. The Critical Path Method (CPM) must be highlighted and all information must be updated at least weekly and published in the ACDat.

For detailed planning, Agile programming systems and Kanban Boards are allowed, in addition not as a substitute.

In the planning of the information phases, however, the following milestones for the drafting/updating of the models must be envisaged:

##### ☐ Programming

- Survey of the state of affairs;
- Delivery;
- Other.

##### ☐ Design

- Survey of the state of affairs;
- Specialist calculations and reports;
- BIM Review (Clash and Code);
- Delivery;
- Other.

##### ☐ Execution

- Start of work, preparation of the construction site;
- Specialist calculations and reports;
- BIM Review (Clash and Code);
- SAL;

- End of works;
- Testing;
- Delivery;
- Other.

#### □Exercise

- As-built model;
- Delivery;
- Other.

#### **15.12.5.20 Policies for the protection and security of information content**

In the offer of Information Management - oGI and consequently in the final Information Management plan - pGI the security policies adopted for the protection of data and the guarantee of the rights connected to them (copyright, patent, etc.) must be explained.

In particular, the following must be explained:

- The pre-deposit rescue and backup systems and their timing;
- The specific IT and information insurance coverage;
- The levels and rights of access and modification provided for each information system adopted;
- The number of post-deposit copies retained and the storage and protection times adopted.

#### **15.12.5.21 Data security regulatory references**

The main regulatory references on the security of computer and information data are reported by referring to UNI EN ISO 19650/11337-6: 2017 and any other mandatory standard in question.

For information security management systems:

- ISO/IEC 27000:2016 Information technology - Security techniques – Information security management systems - Overview and vocabulary
- ISO/IEC 27001:2013 Information technology - Security techniques – Information security management systems – Requirements
- ISO/IEC 27002:2013 Information technology - Security techniques - Code of practice for information security controls<sup>1</sup>
- ISO/IEC 27005:2011 Information technology - Security techniques – Information security risk management
- ISO/IEC 27007:2011 Information technology - Security techniques - Guideliness for information security management systems auditing
- ISO/IEC TR 27008:2011 Information technology - Security techniques – Guideliness for auditors on information security controls

For privacy:

- ISO/IEC 29100:2011 Information technology - Security techniques – Privacy framework<sup>1</sup>

For professional profiles:

- UNI 11506:2013 Non-regulated professional activities - Professional figures operating in the ICT sector - Definition of knowledge, skills and competence requirements
- UNI 11621-2:2016 Non-regulated professional activities - Professional profiles for ICT - Part 2: "Second generation" professional profiles

- UNI 11621-4:2016 Non-regulated professional activities - Professional profiles for ICT - Part 4: Professional profiles related to information security

For techniques and technologies:

- ISO/IEC 9798-1:2010 Information technology - Security techniques – Entity authentication - Part 1: General
- ISO/IEC 18033:2015 Information technology - Security techniques – Encryption algorithms - Part 1: General
- ISO/IEC 27039:2015 Information technology - Security techniques - Selection, deployment and operations of intrusion detection systems (IDPS)
- ISO/IEC 27040:2015 Information technology - Security techniques – Storage security
- ISO/IEC 29115:2013 Information technology - Security techniques – Entity authentication assurance framework.

#### 15.12.5.22 Additional data security requests

Please find the list of additional data security requests. Otherwise, please refer to current legislation.

For example: "... Any sensitive data (national, national military, supranational military security - NATO, state secrecy, etc.) must refer to the specific rules on the subject to which reference is made in full ...".

#### 15.12.5.23 Data sharing methods (CDE/ACDat)

For the purpose of efficiency in the sharing of data, information and information content (models and documents) their status of definition and approval must always be identifiable according to UNI EN ISO 19650/11337-4: 2017:

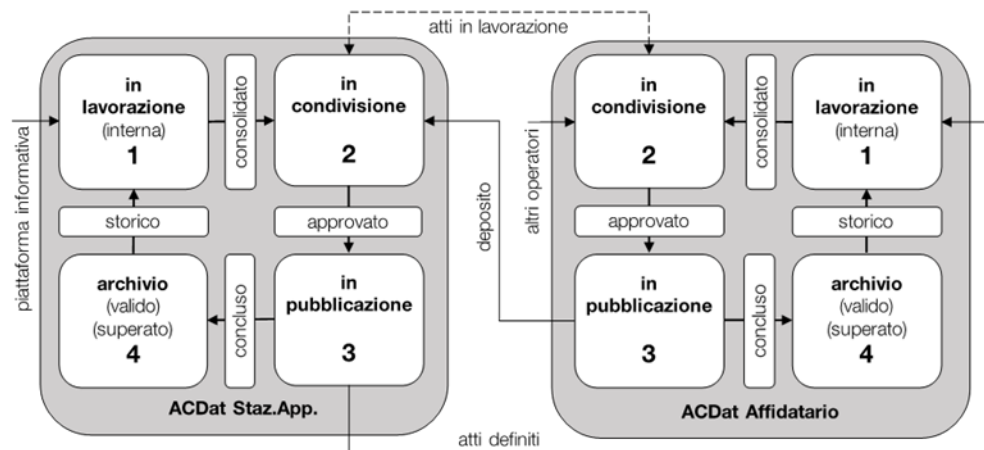
- Definition status:
  - L0: being processed/updated;
  - L1: in the process of sharing;
  - L2: in the process of publication;
  - L3: archived:
    - L3. V "valid", version still in force;
    - L3. S "outdated", relating to versions prior to the one in force and therefore replaced.
- Approval status:
  - A0: to be approved;
  - A1: approved;
  - A2: approved with comment;
  - A3: Not approved

In the Offer of Information Management - oGI and consequently in the final Information Management plan - pGI the Appointed party must, therefore, specify how he intends to satisfy this request.

#### 15.12.6 4.9.1 Characterization of sharing infrastructures

The ACDat of the Appointing party and the Appointed party must be divided into at least four sections useful for the distribution of data, information and information content of the Contract according to the state of definition referred to in the previous point.

The data exchange flow from the ACDat of the Appointing party to the ACDat of the Appointed party must follow the proposed scheme:



**Construction of ACDat and information flow (a.pavan)**

Where:

5. **in progress** (internal): internal work environment and data acquisition not visible from subjects external to the organization;
  6. **sharing**: data sharing environment processed but not completed or coordinated;
  7. **in publication**: completed and coordinated data sharing environment;
  8. **archive** (valid, outdated): internal working environment.
- **Consolidated**: models and elaborations are sufficiently consolidated for sharing with third parties for the purpose of coordination
  - **approved\***: the models and drawings, concluded internally and coordinated, are approved for publication and making available to third parties in the Contract
  - **concluded**: the models and the elaborations are concluded and no longer necessary for the elaboration of the third parties for the specific phase in place
  - **historical**: the models and the elaborations are made accessible internally to the processing as a database for other phases or Contracts

#### □ If NOT in possession of an ACDat

In the Offer of Information Management - oGI and consequently in the final Information Management Plan - pGI, the access rules must be defined, the rights of the accredited subjects to operate in the ACDat of the Appointed party.

The ACDat of the Appointed party must guarantee the security of the data contained therein, also providing for special backup and disaster recovery functions.

The same must guarantee the traceability of the operations carried out of which the Appointing party can make an explicit request in case of disputes.

#### □ If you have an ACDat

In detail, the characteristics of the data sharing infrastructure are better described in the Annex: Data Sharing Platform.

### 15.12.6.1 System of deposit

The deposit of data, information and information content (models and / or drawings UNI EN ISO 19650/11337-1: 2017) relating to services, works or supplies subject to contract, for each phase of the planned process, takes place, in general, through:

- Digital support



- of files in open format (PDF), Digitally Signed;
- of files in open format, Electronically Signed by deposited in a structured data sharing environment with specific management rules, hereinafter ACDat (Legislative Decree 50/16, art. 23 and its implementing decrees; UNI EN ISO 19650/11337-1-5:2017);
- any files in proprietary format (not definable by the client / Contracting Station, due to specific needs of transparency, congruence and data management), signed electronically through deposit in the ACDat (above);
- Paper support
  - of documents drawn up not digitally (UNI EN ISO 19650/11337-1:2017), with Handwritten Signature;
  - of reproductions (by print, plotting, etc.), with Handwritten Signature, of digitally drawn up works and extrapolations/views, etc. of models ("multidimensional models, object-oriented", Ministerial Decree no. 560 of 01.12.2017, art. 4, paragraph 1), "graphic", "documentary", "multimedia" models (UNI 11337-1:2017).

For the filing of tender and procurement documents of this specific ☐Supply Service Work ☐  
see what is provided in the "... report details of the reference document...".

The contractual prevalence of data, information and information content always remains:

- in the works on digital support in open format (PDF), Digitally Signed;
- in paper documents with Handwritten Signature (Legislative Decree 50/16, art. 23 and its implementing decrees).

It is the obligation of the Appointed party to declare the consistency of the information content deposited on paper with a Handwritten Signature or on digital support, in open format (PDF), with Digital Signature, with respect to the proprietary models and digital documents from which they originated.

For any other information concerning the storage of data on the data sharing platform – ACDat, please refer to the Annex: Data Sharing Platform.

#### 15.12.6.1.1 File management

*Provide reference directions for file management.*

#### 15.12.6.1.2 Data management

*Provide reference guidance for data management.*

### 15.12.6.2 **Management of supply chain information content**

In the Offer of Information Management - oGI and consequently in the final Plan of Information Management - pGI, the method of programming and managing the information content of any sub-contractors must be explained.

The Appointing party considers as communicated and acquired the information rules of these Information Specifications - CI in question, as well as those of the Information Management offer - oGI and the final Information Management Plan - pGI of the main Distributor, for each sub-contractor interested in the Contract.

The Processor is in any case responsible for the completeness and congruence of data, information, elaborations and models produced by each of its sub-contractors. In addition to the management of its ACDat towards the same sub-contractors.

#### **15.12.6.3      *Verification procedures, validation of information content***

All models, drawings and objects produced for this Contract will be subject to verification and consequent validation by the Contractor in compliance with current regulations.

##### **15.12.6.3.1      Definition of validation procedures**

In the Information Management offer - oGI and consequently in the final Information Management plan - pGI, the procedures for the informative validation of their data, information, models, documents and objects that the Appointed party intends to carry out in the performance of the Contract must be explained.

In particular, the following must be defined:

- The procedures;
- The timing;
- Responsibilities;
- The object of validation.

##### **15.12.6.3.2      Definition of the structure of verification operations**

In the Offer of Information Management - oGI and consequently in the final Information Management Plan - pGI, the articulation of the verification operations that are intended to be applied and guaranteed, defined according to the Verification Levels referred to in UNI EN ISO 19650/11337-5: 2017, must be explained:

- LV1: internal, formal verification of the methods of production, delivery and management of data;
- LV2: internal, substantial verification of readability, traceability and consistency of data in models and between models;
- LV3: independent, formal and substantive verification of readability, traceability and consistency of data in models, processes, objects and their iteration

##### **15.12.6.3.3      4.      Information coordination**

The following paragraphs analyse the methods of coordination of the data produced for this Contract.

Therefore, in the Offer of Information Management - oGI and consequently in the final Information Management Plan - pGI, the methods of coordination of the models, the methods of searching for interferences and inconsistencies and their resolution must be explained and analyzed.

##### **15.12.6.3.4      4.Coordination of models**

In the Offer of Information Management - oGI and consequently in the final Information Management Plan - pGI, the methodology and temporality of coordination of the graphic models and the related extrapolated or connected drawings must be explained.

The coordination must involve, even to different degrees, each model created for this Contract.

Therefore, coordination is required according to UNI EN ISO 19650/11337-5:2017:



- LC1 – (first level coordination) Coordination of data and information within a graphic model of the same discipline;
- LC2 – (second level coordination) Coordination of data and information between several individual graphic models of the various disciplines..
- LC3 – (third level coordination) Coordination of data and information generated by graphic models and data and information not generated by graphic models (digital or non-digital processing).

The coordination must be reported through special reports that explain its completion and the result achieved.

#### 15.12.6.3.5 Information interferences (clash detection)

In the Offer of Information Management - oGI and consequently in the final Information Management Plan - pGI, the procedures for analyzing information interference for models, documents and objects must be explained.

It is required that, when possible or significant for the economy of the intervention, not only interference with the objects themselves is considered, but also with respect to the relative areas of assembly, maneuvering and maintenance.

For the purpose of managing coordination for interference analysis, a matrix such as the one proposed below may be used:

<i>OBJECT OF THE COORDINATION</i>	<i>Coordinationlive</i>	<i>Facilities</i>	<i>Electric</i>	<i>...</i>	<i>...</i>	<i>Safety</i>	<i>Other Models</i>
<i>Object/Object</i>	LC1						
<i>Model(s)</i>	LC2						
<i>Model/Papers</i>	LC3						
<i>...</i>	<i>...</i>						
<i>...</i>	<i>...</i>						
<i>...</i>	<i>...</i>						
<i>Object/Object</i>	LC1						
<i>Model(s)</i>	LC2						
<i>Model/Papers</i>	LC3						

NOTE: Empty cells can be used to indicate, by way of example and not exhaustively: which coordination will be ensured, the timing of coordination, the execution – or not – of a coordination, the outcome of the same (favorable, negative, partial, etc.).

The coordination analyses for interference are obviously free and called each time the Appointing party deems it necessary, but some cadenced and scheduled coordination milestones will still have to be defined.

At the end of each milestone analysis, a report of the interferences found for the subsequent resolution phases must be drawn up

#### 15.12.6.3.6 Code checking

In the offer of Information Management - oGI and consequently in the final Plan of Information Management - pGI, the procedures for analyzing information inconsistencies for models, documents and objects must be explained.

For the purpose of managing coordination for the analysis of inconsistencies, a matrix such as the one proposed below can be used:

<i>MODEL</i>	<i>OBJECT OF THE COORDINATION</i>	<i>Level of coordination</i>	<i>European legislation</i>	<i>National legislation</i>	<i>Regional legislation</i>	<i>Other legislation and standards</i>	<i>Energy saving</i>	<i>Acoustics</i>	<i>Contractual obligations</i>	<i>Design constraints</i>	<i>Constraints butnourishing</i>	<i>Other constraints</i>
<i>Facilities</i>	<i>Object</i>	LC1										
	<i>Model</i>	LC2										
	<i>Processed</i>	LC3										
<i>Other models</i>	<i>Object</i>	LC1										
	<i>Model</i>	LC2										
	<i>Processed</i>	LC3										

NOTE: Empty cells can be used to indicate, by way of example and not exhaustively: which coordination will be ensured, the timing of coordination, the execution – or not – of a coordination, the outcome of the same: favorable, negative, partial, etc.

The coordination analyses of inconsistencies are obviously free and called whenever the Appointing party deems it necessary, but some timed and scheduled coordination milestones will still have to be defined.

At the end of each milestone analysis, a report of the inconsistencies found for the subsequent resolution phases must be drawn up.

#### 15.12.6.4 Definition of how interference and inconsistencies are resolved

In the Offer of Information Management - oGI and consequently in the final Information Management Plan - pGI, the methods for resolving interferences and information inconsistencies that may be found in the coordination processes must be explained.

In particular, at least the following must be defined:

- The procedures for convening coordination meetings;
- The legal entity responsible for the coordination meetings (and any modalities of replacement or rotation);
- The methods of defining possible rules of prevalence between models or drawings;
- The methods of resolution of the critical issues that have emerged and the responsibilities of resolution;
- The mode of interest of the Appointing party.

**15.12.6.5      *How to manage 4D, 5D, 6D and 7D information***

In the Offer of Information Management - oGI and consequently in the final Information Management Plan - pGI, the methods of use of the models for the purpose of managing the planning of activities (4D), production costs (5D), management and maintenance of the work (6D), sustainability in production and operation (7D) must be explained.

All information attributes that may be necessary to satisfy the methods of use specified herein must comply with the requests made in these Information Specifications - CI with reference to the chosen LOIN.

**15.12.6.6      *Management of programming (4D – Gantt, WBS, etc.)***

In the Offer of Information Management - oGI and consequently in the final Information Management Plan - pGI, the methods of use of the models for the management of the planning of activities (4D) must be explained. By way of example and not exhaustively, it may be specified:

- The link between graphic model objects and WBS activities;
- The definition of the start/end times between the information attributes of the objects;
- Other...

**15.12.6.7      *Economic management (5D – calculations, estimates, etc.)***

In the Offer of Information Management - oGI and consequently in the final Information Management Plan - pGI, the methods of use of the models for the purpose of cost management (5D) must be explained.

By way of example and not exhaustively, it may be specified:

- The link between chart model objects and price list items;
- The definition of products among the information attributes of objects;
- Other...

**15.12.6.8      *Management of the work (6D – management, maintenance and disposal)***

In the Offer of Information Management - oGI and consequently in the final Information Management Plan - pGI, the first indications on how to use the models for the purposes of management during the exercise phase (6D) must be explained.

By way of example and not exhaustively, it may be specified:

- The link between graphic model objects and maintenance activities;
- The definition of the useful life cycles of products among the information attributes of objects;
- The definition of maintenance cycles among the information attributes of objects;
- Other...

**15.12.6.9      *Management of externalities (7D – Environmental sustainability, etc.)***

In the Offer of Information Management - oGI and consequently in the final Information Management Plan - pGI, the methods of use of the models for the purposes of sustainability management (7D) must be explained.

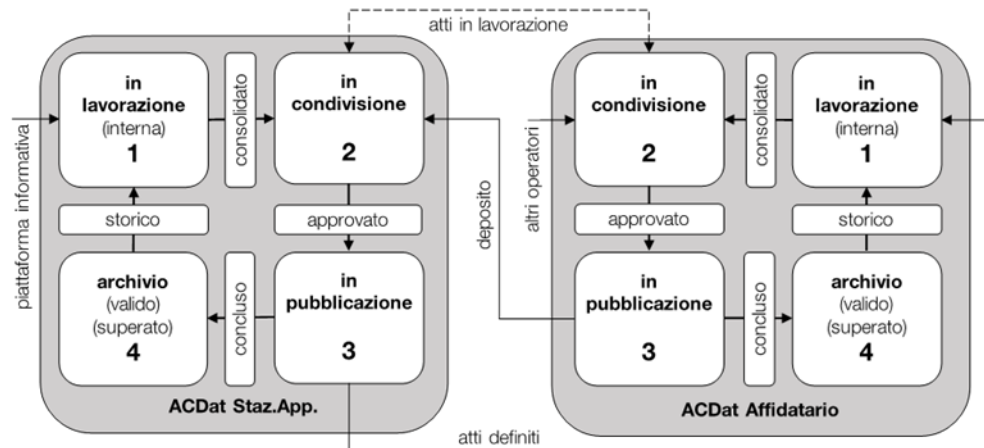
By way of example and not exhaustively, it may be specified:

- Energy Efficiency;
- Acoustic Analysis;
- Other...

### 15.12.6.10 Deposit methods

□ If ACDat of the Appointing party

Once the Contract has been completed, each model or elaboration contained in the ACDat of the Appointing party will be transferred from the "in publication" section to the "archive" section.



**Construction of ACDat and information flow (a.pavan)**

Each model or process is considered deposited, in a digital sense, at the time of uploading in its open format in the "shared" section of the ACDat of the order. At the time of loading, the protocol will be recorded with date, time and person responsible for the upload itself.

The validity and usability towards third parties also takes place from the publication (transfer in the "in publication" section).

At the time of uploading, the files that need a Digital Signature will be indicated.

□ If ACDat of the Appointed party

...

The digital filing does not conclude the terms of the filing of each hard copy required in the contract, nor of the delivery of the models in their native (even if proprietary) format.

The contractual relationship will be considered concluded following the delivery of the documents in the following manner and order:

- Deposit of a hard copy with Handwritten Signature;
- Digital deposit with Digital Signature;
- Deposit models (in their native format, although proprietary).

### 15.12.6.11 Model Properties

The models and all the objects contained therein and the elaborations, data and information relating to this Contract, also connected to the reading and use of the models as specified in this Information Specification - CI, will be considered the property of the Appointing party who may manage this property at will without any duty to the Contractor. Copyright is reserved according to current legislation.



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## 15.13 Platform Data Management – PDM

TEMPLATE

# Platform Data Management – PDM

Data Management Platform

Annex E



RISANAMENTO SpA

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### 15.13.1 Introduction

This document represents Annex E to the OIL Organization Information Guidelines on data management within the Organization.

The Platform Management Data (PMD) is also completed through the Common Data Environment (CDE) and the Data Room (DR), which are also annexes of the OIL (to E1 and E2).

Please note that the general information flow is shown in Fig. 1 of the Organization Information Guidelines – OIL.

### 15.13.2 Regulatory references

#### 15.13.2.1 Rules

Reference is made to the following standards:

- Legislative Decree 50/2016 and subsequent amendments.
- MIT Ministerial Decree no. 560 of 1.12.2017

#### 15.13.2.2 Standards

Reference is made to the following Standards:

- UNI EN ISO 19650/11337-1 - *Construction and civil engineering works - Digital management of construction information processes - Part 1: Models, documents and information objects for products and processes*
- UNI EN ISO 19650/11337-3 - *Construction and civil engineering works - Criteria for coding construction works and products, activities and resources - Part 3: Models for the collection, organization and storage of technical information for construction products*
- UNI EN ISO 19650/11337-4 - *Construction and civil engineering works - Digital management of construction information processes - Part 4: Evolution and information development of models, drawings and objects*
- UNI EN ISO 19650/11337-5 - *Construction and civil engineering works - Digital management of construction information processes - Part 5: Information flows in digitalized processes*
- UNI EN ISO 19650/11337-6 - *Construction and civil engineering works - Digital management of construction information processes - Part 6: Guidelines for the preparation of the information specifications*
- UNI EN ISO 19650/11337-7 - *Construction and civil engineering works - Digital management of construction information processes - Part 7: Knowledge, skills and competence requirements of the figures involved in the management and information modeling*

### 15.13.2.3 Acronyms and glossary

Here is a legend of the acronyms used and a synthetic glossary of the related terms related to BIM and the digitization of the construction sector in the design of the interventions:

ACRONYMS	DEFINITION TERMS	
	Digital Collaborative Platform	Digital environment for the organized collection and sharing of data, information, models, objects and documents related to the construction supply chain: resulting products, component products and processes (objects, subjects, actions. (UNI EN ISO 19650/11337-1)
ACDat/CDE	Data sharing environment	Information source agreed for a given order or real estate asset (3.2.8), to collect, to manage and to forward each information container for the entire duration of the management of a contract. (UNI EN ISO 19650-1)
DB	Database	Collector of information through which it is possible to make it available to any user.
	Datum	Intangible, elementary cognitive element, interpretable within a communication process through previously shared rules and syntax. (UNI EN ISO 19650/11337-1)

For any other term of an informative nature, reference is made to the mandatory legislation in question and, below, to the voluntary technical standard (UNI 11337 standard, CEN standards and ISO standards, if not in contrast).

### 15.13.3 Purpose

The purpose of this document is to identify the data management methods in the Organization in question; investigating flows, IT structure and dedicated instrumentation in order to better understand the administration and use of the same.

### 15.13.4 3 Information flows

#### 15.13.5 3.1 Information flows within the platform

*Describe the information flows of the platform used by Risanamento Spa for data management.*

#### 15.13.6 3.1.1 Approval information flows

*Describe the approval information flows of the platform used by Risanamento Spa for data management.*

### 15.13.7 Input and output information flows

*Describe the input and exit information flows of the platform used by Risanamento Spa for data management.*

#### 15.13.7.1 Storage and protocol functions

*Describe the storage and protocol functions of the platform used by Risanamento Spa for data management.*



**15.13.7.2 File metadata**

*Define the metadata of the files inserted in the platform used by Risanamento Spa for data management.*

**15.13.7.3 Coordination functions DB - CDE**

*Describe the coordination functions between the Data Base (DB) and the Data Sharing Environment (ACDat/CDE).*

**15.13.8 IT structure of the platform****15.13.8.1 Information architecture**

*Describe the information architecture of the platform used by Risanamento Spa for data management.*

**15.13.8.2 Dialogue protocols**

*Describe the dialogue protocol of the platform used by Risanamento Spa for data management.*

**15.13.9 Dedicated tools****15.13.9.1 Platform hardware tools**

*Describe the hardware tools of the platform used by Risanamento Spa for data management.*

**15.13.9.2 Platform software tools**

*Describe the software tools of the platform used by Risanamento Spa for data management.*



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## 15.14 Common Data Environment - CDE

TEMPLATE

# Common Data Environment – CDE

Data Sharing Environment

Annex E1



**RISANAMENTO SpA**

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### 15.14.1 Introduction

This document represents Annex E1 to the OIL Organization Information Guidelines on data management within the Organization.

The Common Data Environment (CDE) is also completed through the Platform Data Management (PDM) and the Data Room (DR), which are also annexes of the OIL (E and E2).

Please note that the general information flow is shown in Fig. 1 of the Organization Information Guidelines – OIL.

### 15.14.2 Regulatory references

#### 15.14.2.1 Laws

Reference is made to the following standards:

- Legislative Decree 50/2016 and subsequent .m.i.
- MIT Ministerial Decree no. 560 of 1.12.2017

#### 15.14.2.2 Standards

Reference is made to the following Standards:

- UNI EN ISO 19650/11337-1 - *Construction and civil engineering works - Digital management of construction information processes - Part 1: Models, documents and information objects for products and processes*
- UNI EN ISO 19650/11337-3 - *Construction and civil engineering works - Criteria for coding construction works and products, activities and resources - Part 3: Models for the collection, organization and storage of technical information for construction products*
- UNI EN ISO 19650/11337-4 - *Construction and civil engineering works - Digital management of construction information processes - Part 4: Evolution and information development of models, drawings and objects*
- UNI EN ISO 19650/11337-5 - *Construction and civil engineering works - Digital management of construction information processes - Part 5: Information flows in digitalized processes*
- UNI EN ISO 19650/11337-6 - *Construction and civil engineering works - Digital management of construction information processes - Part 6: Guidelines for the preparation of the information specifications*
- UNI EN ISO 19650/11337-7 - *Construction and civil engineering works - Digital management of construction information processes - Part 7: Knowledge, skills and competence requirements of the figures involved in the management and information modeling*

### 15.14.3 Acronyms and glossary

Here is a legend of the acronyms used and a synthetic glossary of the related terms related to BIM and the digitization of the construction sector in the design of the interventions:

ACRONYMS	DEFINITION TERMS	
	Digital Collaborative Platform	Digital environment for the organized collection and sharing of data, information, models, objects and documents related to the construction supply chain: resulting products, component products and processes (objects, subjects, actions. (UNI EN ISO 19650/11337-1)
ACDat/CDE	Data sharing environment	Information source agreed for a given order or real estate asset , to collect, to manage and to forward each information container for the entire duration of the management of a contract. (UNI EN ISO 19650-1)
DB	Database	Collector of information through which it is possible to make it available to any user.
	Datum	Intangible, elementary cognitive element, interpretable within a communication process through previously shared rules and syntax. (UNI EN ISO 19650/11337-1)
	Metadata	Kit of information to computer documents, useful for their description and administration.

For any other term of an informative nature, reference is made to the mandatory legislation in question and, below, to the voluntary technical standard (UNI 11337 standard, CEN standards and ISO standards, if not in contrast).

### 15.14.4 Purpose

The purpose of this document is to identify the data management methods in the Organization in question; investigating flows, IT structure and dedicated instrumentation in order to better understand the administration and use of the same.

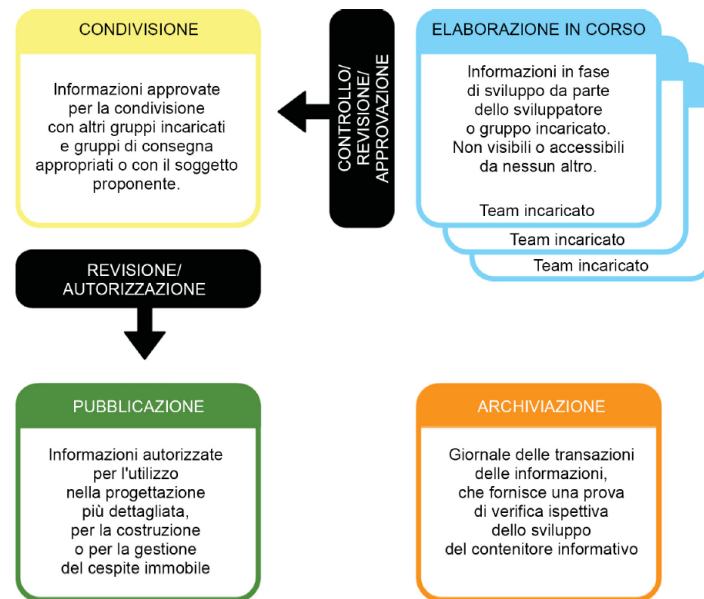
### 15.14.5 Information flows

### 15.14.6 Information flows within the CDE

Risanamento Spa adopts as Data Sharing Environment – ACDat (or CDE) the product usBIM.platform by ACCA Software.

Each project created within it provides a configuration in line with the indications provided by UNI EN ISO 19650. Therefore , users, with regulated and different permissions, will have the following folders available:

- L0\_LAVORAZIONE, containing information under development and visible only to the individual;
- L1\_CONDIVISIONE, information approved by the Distributor for sharing with the Appointing party;
- L2\_PUBBLICAZIONE, information authorized by the Appointing party for use in the most detailed design;
- L3\_ARCHIVIO, history of all information shared and published during the information management process as well as a protocol to verify their development.



**Principle of the Data Sharing Environment - UNI EN ISO 19650-1:2018**

The documentation, therefore, passes through the folders according to its "state". Regarding the flow of operations initiated by the user, please refer to the platform-specific manual.

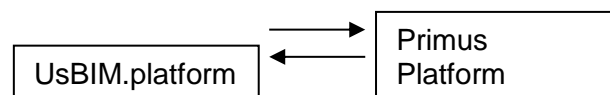
In addition, this ACDat allows you to connect with other management environments such as:

- Primus Platform, a useful environment for construction management.

The connection with this environment is visible within each project specially made in a multifunctional bar that allows you to navigate inside:

- Project settings ("Edit Project");
- The specific area of the project structured according to the folders suggested by UNI EN ISO 19650/11337-5:2017;
- The facilitated search area ("TagBIM");
- The Works Management area ("Works Management");
- The area of investigation on the operations carried out on the platform ("Events");
- The user's area of operation ("Workflow" and "Task").

The flow that is therefore configured within usBIM.platform is a linear and direct flow with the only environment connected to it, as shown in the following figure:



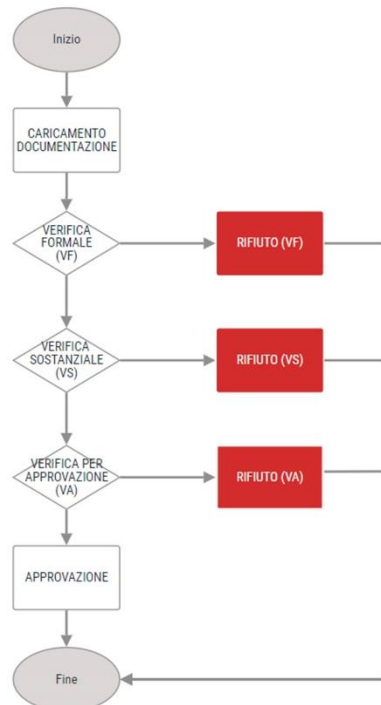
**Internal flow to CDE**

#### 15.14.6.1 Deposit information flows

For the deposit of files on the platform, the Appointed party is invited to follow the instructions punctually described in the "upload documentation" step of the Approval Workflow. Every activity carried out by users is then visible within the "Events" section.

### 15.14.6.2 Approval information flows

Within the platform, an information flow of approval of the documentation has been configured, which is structured as follows:



**Approval information flow (a.pavan)**

Each document uploaded to the platform within the specific project undergoes an approval process structured in three distinct moments:

- Formal verification, aimed at identifying the consistency between the uploaded documents and the documents described in the Letter of Transmission;
- Substantial verification, designed to verify the consistency of the documentation and data delivered in line with what is required in the Information Specifications;
- Verification by Approval, designed to identify any deficiencies that escaped the previous verification.

### 15.14.6.3 Input and output information flows

*In this paragraph, the input and exit information flows are described as, for example, reported below:*

You can identify two levels of input and output flows:

- Input and output flows external to the ACDat;
- Input and output flows inside the aACDat.

In the first case, this is the exchange between ACDat and the data sharing platform. In the second case, instead, of the movement of data within the ACDat itself.

*Insert first stream*

*Insert second stream*

Please note that all documents uploaded within usBIM.platform can no longer be deleted. Therefore, "output" of data can be understood, in this case, the movement from one project to another within the sharing environment itself.

**15.14.6.4 Storage and protocol functions**

The ACData chosen by Risanamento Spa provides for the contemplation of the "Events" section within it which concerns and performs all the part related to the functions of deposit and protocol.

**15.14.6.5 File metadata**

Each file inserted within usBIM.platform is characterized by its TAGs that at the time of download are concretized in readable metadata and linked to the file itself.

**15.14.6.6 IT structure of the CDE****15.14.6.7 Information architecture**

*Describe the information architecture of usBIM.platform.*

**15.14.6.8 Dialogue protocols**

*Describe the usBIM.platform dialog protocols (e.g. available and personal APIs).*

**15.14.7 Dedicated tools****15.14.7.1 CDE Hardware Tools**

The hardware tools used to manage usBIM.platform are those described in the Organization Information Guidelines - ILO. Therefore, please refer to the homonymous paragraph of the cited document.

**15.14.7.2 CDE software tools**

The Data Sharing Environment in question (usBIM.platform) is a product in the Cloud. Therefore it is not necessary to install the software on the hardware intended for its use, but you will only need to access the following email address:

<https://platform.usbim.com/index.vm>

The login credentials (user and password) are provided directly by ACCA Software following registration to the portal. The registration link is provided to users automatically, together with their addition to the project by Milano Santa Giulia Spa.



## 15.15 Data Room - DR



**POLITECNICO**  
MILANO 1863

DIPARTIMENTO DI ARCHITETTURA,  
INGEGNERIA DELLE COSTRUZIONI  
E AMBIENTE COSTRUITO

### TEMPLATE

## Data Room – DR

Document Sharing Environment

Annex E2



RISANAMENTO SpA

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### 15.15.1 Introduction

This document represents Annex E2 to the OIL Organization Information Guidelines on data management within the Organization.

The Data Room (DR) is also completed through the Platform Data Management (PDM) and the Common Data Environment (CDE), which are also annexes of the OIL (E and E1).

Please note that the general information flow is shown in Fig. 1 of the Organization Information Guidelines – OIL.

### 15.15.2 Regulatory references

### 15.15.3 Rules

Reference is made to the following standards:

- Legislative Decree 50/2016 and subsequent
- MIT Ministerial Decree no. 560 of 1.12.2017

### 15.15.4 1.1.2 Standards

Reference is made to the following Standards:

- UNI EN ISO 19650/11337-1 - *Construction and civil engineering works - Digital management of construction information processes - Part 1: Models, documents and information objects for products and processes*
- UNI EN ISO 19650/11337-3 - *Construction and civil engineering works - Criteria for coding construction works and products, activities and resources - Part 3: Models for the collection, organization and storage of technical information for construction products*
- UNI EN ISO 19650/11337-4 - *Construction and civil engineering works - Digital management of construction information processes - Part 4: Evolution and information development of models, drawings and objects*
- UNI EN ISO 19650/11337-5 - *Construction and civil engineering works - Digital management of construction information processes - Part 5: Information flows in digitalized processes*
- UNI EN ISO 19650/11337-6 - *Construction and civil engineering works - Digital management of construction information processes - Part 6: Guidelines for the preparation of the information specifications*
- UNI EN ISO 19650/11337-7 - *Construction and civil engineering works - Digital management of construction information processes - Part 7: Knowledge, skills and competence requirements of the figures involved in the management and information modeling*

### 15.15.5 Acronyms and glossary

Here is a legend of the acronyms used and a synthetic glossary of the related terms related to BIM and the digitization of the construction sector in the design of the interventions:

ACRONYMS	DEFINITION TERMS	
	Digital Collaborative Platform	Digital environment for the organized collection and sharing of data, information, models, objects and documents related to the construction supply chain: resulting products, component products and processes (objects, subjects, actions. (UNI EN ISO 19650/11337-1)
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### 15.15.6 Purpose

The purpose of this document is to identify the data management methods in the Organization in question; investigating flows, IT structure and dedicated instrumentation in order to better understand the administration and use of the same.

### 15.15.7 Document archive

#### 15.15.7.1 Deposit system

*Describe the document filing system provided by Risanamento Spa (e.g. how and where the designer delivers the paper documentation).*

#### 15.15.7.2 Storage system

*Describe the document archiving system provided by Risanamento Spa.*

#### 15.15.7.3 Archive logistics

*Describe the archive logistics provided by Risanamento Spa.*

#### 15.15.7.4 Document security

*Describe the documentary security required by Risanamento Spa.*

## 16 Conclusions

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The European Directive 2014/24/EU, states that the EU Member States may require in the coming years the use of specific electronic tools for public tenders. Moreover, beyond the legal requirements, the BIM methodology will enable the in-depth knowledge of the heritage and its maintenance status and the correct management of information, that are fundamental elements to ensure careful organizing of planned and unplanned maintenance interventions; all this to ensure the performance of buildings over the years by maintaining and improving their performance in terms of energy efficiency and environmental sustainability, while preserving their economic value.

Foreseen as part of the HORIZON 2020 – BIM4EEB project, these guidelines are a support for private organizations in the process of approaching BIM, with the aim of:

- Be more competitive in the new BIM-based growing market, by offering them indications to participate to public tenders where BIM is required.
- Encouraging the digital transformation by promoting working collaboration based on BIM between private and public stakeholders.
- Provide a clear and common vision of the BIM application process within the organization
- Ensure the interoperability of the BIM model with the different software platforms used
- Define BIM information job roles considering their support to “traditional roles”

The guidelines have been presented as a main document and its attachments to be used in different phases of the project.

The guidelines offer support to private companies to digitalize their own organization and to be competitive in the participation to public tenders for maintenance and renovation of building. Indeed, the public bodies announce many public tenders for the renovation of the assets with the aim of improving their energy efficiency and sustainability.

In particular, the guidelines (OIL and its attachments) assume operational value as "Templates" modifiable according to the needs to be applied in real operational contexts.

Furthermore, this document provides general information regarding the regulatory references to hardware and software characteristics, the LOINs of the BIM models, the roles of the personnel for information purposes, the data sharing method, the file format, the encoding of the project, at the levels of coordination and verification of digital models, at the skills and training of the personnel who cover BIM roles.

## 17 Bibliography

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BS 1192:2007 Collaborative production of architectural, engineering and construction information - code of practice (+A2:2016)

BS PAS 1192-2: 2013 Specification for information management for the capital/delivery phase of construction projects using building information modelling

Industry Foundation Classes (IFC) for data sharing in the construction and facility management industries (ISO 16739:2013)

ISO 19650 - Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) – Information management using building information modelling Part 1: Concepts and principles; Part 2: Delivery phase of the assets

ISO 55000: 2014 Asset management - Overview, principles and terminology

ISO 9000:2015 - Quality management systems - Fundamentals and vocabulary

ISO 9001:2015 - Quality management systems – Requirements

ISO 9004:2018 - Quality management - Quality of an organization - Guidance to achieve sustained success

ISO/IEC 18033:2015 Information technology - Security techniques – Encryption algorithms - Part 1: General

ISO/IEC 27000:2016 Information technology - Security techniques – Information security management systems - Overview and vocabulary

ISO/IEC 27001:2013 Information technology - Security techniques – Information security management systems – Requirements

ISO/IEC 27002:2013 Information technology - Security techniques - Code of practice for information security controls

ISO/IEC 27005:2011 Information technology - Security techniques – Information security risk management

ISO/IEC 27007:2011 Information technology - Security techniques - Guidelines for information security management systems auditing

ISO/IEC 27039:2015 Information technology - Security techniques - Selection, deployment and operations of intrusion detection and prevention systems (IDPS)

ISO/IEC 27040:2015 Information technology - Security techniques – Storage security

ISO/IEC 29100:2011 Information technology - Security techniques – Privacy framework

ISO/IEC 29115:2013 Information technology - Security techniques – Entity authentication assurance framework

ISO/IEC 9798-1:2010 Information technology - Security techniques – Entity authentication - Part 1: General

ISO/IEC TR 27008:2011 Information technology - Security techniques – Guidelines for auditors on information security controls

OMNICLASS available at: <http://www.omniclass.org>; [Accessed 2 September 2021]

Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation)

UNICLASS. available at: <https://toolkit.thenbs.com/articles/classification/>; [Accessed 2 September 2021]

UNIFORMAT available at: <https://www.nist.gov>; [Accessed 2 September 2021]

UNI 11337-1:2017 Edilizia e opere di ingegneria civile - Gestione digitale dei processi informativi delle costruzioni - Parte 1: Modelli, elaborati e oggetti informativi per prodotti e processi

UNI/TR 11337-2:2021

Edilizia e opere di ingegneria civile - Gestione digitale dei processi informativi delle costruzioni - Parte 2: Flussi informativi e processi decisionali nella gestione delle informazioni da parte della committenza

UNI/TS 11337-3:2015 Edilizia e opere di ingegneria civile - Criteri di codificazione di opere e prodotti da costruzione, attività e risorse - Parte 3: Modelli di raccolta, organizzazione e archiviazione dell'informazione tecnica per i prodotti da costruzione

UNI 11337-4:2017 Edilizia e opere di ingegneria civile - Gestione digitale dei processi informativi delle costruzioni - Parte 4: Evoluzione e sviluppo informativo di modelli, elaborati e oggetti

UNI 11337-5:2017 Edilizia e opere di ingegneria civile - Gestione digitale dei processi informativi delle costruzioni - Parte 5: Flussi informativi nei processi digitalizzati

UNI/TR 11337-6:2017 Edilizia e opere di ingegneria civile - Gestione digitale dei processi informativi delle costruzioni - Parte 6: Linea guida per la redazione del capitolato informativo

UNI 11337-7:2018 Edilizia e opere di ingegneria civile - Gestione digitale dei processi informativi delle costruzioni - Parte 7: Requisiti di conoscenza, abilità e competenza delle figure coinvolte nella gestione e nella modellazione informativa